COPYRIGHT NOTICE

GRAPHIC ILLUSTRATIONS

All drawings, including system layout, hardware devices, controls and indicators, screens, and maintenance drawings are provided to enhance understanding of the accompanying text. These graphics are representations only; they are not necessarily drawn to scale and may not represent parts of your specific machine.

TRADEMARKS

All trademarks used in this manual are the property of their respective owners.

SOFTWARE LICENSING AGREEMENT

This Software License Agreement (the "Agreement") is a legal Agreement between you (either an individual or a single entity) and Christie Digital Systems Inc. for the software known commercially as MASTER*Suite*™ (includes *Display*MASTER™, *Media*MASTER™, *Remote*MASTER™, *Control*MASTER™) contained in the FRC-5000 Display Wall Controller (the "Christie Digital Product"). By using the Christie Digital Product, you agree to be bound by the terms of this Agreement, as well as the terms of the Microsoft End-User License Agreement for the pre-installed operating system and the software license agreements of any other pre-installed application software or device drivers. If you do not agree to the terms of this Agreement, return the Christie Digital Product to the vendor.

LICENSE AND RESTRICTIONS ON LICENSE

License of Software: The Licensor hereby grants to the Licensee a perpetual, personal, nonexclusive, non-transferable license to use the Software in conjunction with the Christie Digital Product.

Copies: The Licensee shall not make any unauthorized copies of the Software or any portion of it. Licensee shall not reverse engineer, disassemble or de-compile the Software or any portion of it.

Authorized Copies: Licensee is permitted to make one archival or backup copy of the Software. Note: the *RemoteServer* and *WallManager* modules can be installed on an unlimited number of client workstations.

Proprietary Notices: All copies of the Software must include all Licensor's copyright, trademark, or proprietary notices.

Modifications and Derivative Works: The Licensee may not modify or create derivative versions of the Software.

Sublicensing: This Agreement does not grant the Licensee the right to grant sublicenses of the Software and the Licensee shall not grant any such sublicense without the prior written approval of the Licensor.

Other Restrictions: The Licensee shall not (i) rent, lease, distribute, or otherwise transfer the Software; and/or (ii) export the Software in violation of federal export laws and regulations.

Ownership: The Licensed Software is and shall at all times remain the property of the Licensor and no right, title or ownership interest of any kind shall pass to the Licensee except in a accordance with this Agreement.

MAINTENANCE AND SUPPORT

Term of Maintenance and Support: The Licensor shall provide maintenance and support services related to the Software ("Support Services"). Support Services are governed by the Licensor's policies and programs described in materials provided by the Licensor. Any supplemental software code provided to you as part of the Support Services shall be considered part of the Software and subject to the terms and conditions of this Software License Agreement.

WARRANTY AND LIMITATION OF LIABILITY

Product Warranties: The Licensor warrants that the Software will perform substantially in accordance with the accompanying written materials for a period of 90 days from the date of receipt of the Christie Digital Product. This warranty is void if the Licensee or any third party changes or modifies the Software. The liability of this Licensor under this section is limited to the correction of any error or malfunction and shall not include liability for loss of data, loss of computer time, any direct damages or any indirect or consequential damages. This warranty only extends to those failures communicated to the Licensor in writing within 90 days of the receipt of the Christie Digital Product. The Licensor does not warrant that the Software is free from any minor defects or that it will operate uninterrupted. The Licensor does not make any other warranties, either express or implied, including, but not limited to, implied warranties of merchantability, fitness for a particular purpose, title and non-infringement, with regard to the Software. Some jurisdictions do not allow limitations or duration of an implied warranty, so the above limitation may not apply to you.

Licensee's Remedy: The Licensor's entire liability and the Licensee's exclusive remedy shall be repair or replacement of the Software that does not meet the Warranty. Any replacement Software will be warranted for the remainder of the original warranty period or thirty (days), whichever is longer.

Exclusions and Limitation of Liability: In no event shall the Licensor be liable for any loss of data or profits or special, incidental, indirect or consequential damages, (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or any other pecuniary loss) arising out of or in connection with the use of or inability to use the Software, even if the Licensor has been advised of the possibility of such damages. In no event will the Licensor be liable for any damages caused by the Licensee's failure to meet Licensee's responsibilities, which responsibilities include without limitation, the provision of properly functioning and compatible hardware, operating systems, or applications software, or arising out of incomplete or inaccurate information provided to the Licensor. In any case, the Licensor's entire liability under this Agreement shall be limited to [CDN$3,000].

TERMINATION AND DEFAULT

Termination: The Licensor may terminate this Agreement if the Licensee breaches or is in default of any obligation. Should this Agreement be terminated for any reason, the Licensee agrees to immediately cease using the Software and to return to the Licensor all copies of the Software. The Licensee's obligation under this section shall survive the termination of the Agreement.

GENERAL

Notices: Unless otherwise set forth in this Agreement, all notices, demands or other communications to the Licensor hereunder shall be in writing (including telecopy) and shall be deemed to have been duly given if delivered during normal business hours by hand, Federal Express, United Parcel Service or other reputable overnight commercial delivery service, by telecopy, confirmation of receipt received, or by mail with return receipt requested, addressed as follows:

Christie Digital Systems Canada Inc.
Legal Department
809 Wellington Street North
Kitchener, Ontario
N2G 4Y7

Severability: If any provision of this Agreement is held to be invalid, such invalidity shall not affect the other provisions of this Agreement.

Waiver: No waiver by the Licensor of any particular default or omission committed by the Licensee shall affect or impair the right of the Licensor in respect of any subsequent default or omission of the same or a different kind. No delay or failure by the Licensor to exercise any rights in connection with any default or omission committed by the Licensee shall affect or impair the Licensor's rights in respect of that particular default or omission or any subsequent default or omission of the same or different kind. In any event, time shall continue to be of the essence without the necessity of specific reinstatement.

Governing Law: This Agreement shall be governed by and interpreted in accordance with the laws of the province of Ontario and the federal laws of Canada applicable therein. The Parties hereby will attorn to the non-exclusive jurisdiction of the Courts of the Province of Ontario.

Typographical Conventions

Please note the following typographical conventions used throughout this manual.

- **Bold** type is used to highlight important information, safety warnings, text-entry box, field name, tab name, check mark item, radio button selection in a dialog box.
- ***"Bold italic"*** type surrounded by quotation marks indicates information you type. For example, enter the file name ***"abcdef"***.
- Dialog boxes, menus, icons, references to other segments of the document, special notes, are set in *Italic Type*. For example, *Main* menu.
- An arrow "⇒" indicates movement through menu options.
  For example, **File ⇒ Save** indicates select Save from the File menu.
- Operational states are CAPITALIZED. For example, turn device ON.
- Push-buttons, LEDs and operational switches are in SMALL CAPS.
- Listed items, where order is of no significance are, preceded by bullets.
- Numbered items are to be performed in the order in which they appear.

Table of Contents

Section 1

Introduction

1.1 Introduction

The FRC-5000 Controller is a device much like a computer that when connected to the projectors in a display wall allows the user, through specially designed wall management software, to control and display several applications simultaneously. The FRC-5000 comes factory pre-configured to suit individual needs.

Some FRC-5000 key features:

- Support for up to 24 display channel outputs per unit
- Support for 32 (with VideoMASTER Switch) and 36 (with VideoMAX) external video input per unit
- Support for up to 8 external RGB inputs per unit
- Support for up to 8 Ethernet interfaces per unit
- Flexible storage sizes and configurations
- *Display*MASTER, *Media*MASTER, (RGB and Video) software
- *Remote*MASTER workstation display wall control
- *Control*MASTER display wall management software
- Hot-swappable 4-module power-supply
- All data transfer is managed by Ultra160 SCSI RAID controller
- Optional Video Input Modules available

Figure 1.1. The FRC-5000 Controller

1.2 Components

The FRC-5000 controller is packaged and shipped in a pre-configured manner. The following list includes all standard components. Components that are optional are marked with an asterisk.
Please ensure that you have received all components.

Main Box:

- FRC-5000 Controller (See 1.21 for a complete listing of all FRC internal components)
- FRC-5000 User Manual (54-017167-xxP)
- Keyboard
- Mouse
- Sliding Rail Rack Mounting Kit
- Quad VGA splitter cable (1 per *Display*MASTER module)
- Video Input Module (1 per *Display*MASTER module)
- ★ *Video Switch 16 BNC Breakout Cables (1 per Video Switch module)*
- ★ *Video Max 16 BNC Breakout Cable (2 per Video Max module)*
- White Box

White Box:

- FRC-5000 Software CD
- SoundBlaster CD
- Adaptec RAID CD
- Operating System CD
- Adaptec Manual
- PS/2 Y adapter (for keyboard and mouse connection to SBC)
- 2 AC line cords
- 2 FRC-5000 front panel keys
- Bracket Mounting Kit
- Mounting Hardware Kit } for Rail Rack Mounting Kit
- Bolts & Washers
- ★ *3 Hard Drive bay locking keys*

FRC-5000 Internal Components

- SBC – Single Board Computer
- RAM – 256 MB, 768 MB, 1 GB (amount depends on model purchased)
- Hard drive
- Floppy disk drive
- CD-ROM drive
- Com 1 / Parallel connector
- Com 2 connector
- USB connectors
- Raid SCSI controller
- *Display*MASTER modules
- Video Input Module (not installed if Video MAX or Video Switch card ordered)
- ★ *VideoMAX modules*
- ★ *Hot Swap Hard Drive Kit (optional, replaces the single hard drive)*
- ★ *Quad Ethernet modules*
- ★ *RGBMaster modules*
- ★ *Video Switch modules*

★ *Indicates optional components that may not be part of the system*

1.3 Purchase Record and Servicing

If you encounter any problems with the FRC-5000 Controller and require assistance, contact CHRISTIE's Controllers Development and Support Group by sending e-mail to mailto:support@christiedigital.com. In North America, phone 1-800-221-8025.

Updated contact information can be found at http://www.christiedigital.com/ under "Contact Christie".

Fill out the information in the table below and keep with your records for future reference

Purchase Record

Controller Serial Number:
Purchase Date:

NOTE: The serial number can be found on the license label.

You can also register your product on-line by visiting **www.christiedigital.com ⇒ Service and Support ⇒ Product Registration.** This will keep you in touch with all the latest product information, such as updates, technical bulletins, downloads and Christie newsletters.

1.4 Using this Manual

This manual is intended to instruct users on how to install, configure and use the FRC-5000 controller.

Sections 1 through 3 provide the user with a general overview of the controller, its components, features and alarm monitoring system. It includes instructions on quick setup and how to connect various external sources. It also provides a look inside the controller and how the various components are wired together.

Sections 4 through 8 describe in detail the MASTER*Suite* software, which includes *MediaMASTER*, *Remote*MASTER and *Control*MASTER applications.

Section 9 provides a spare parts list.

Section 2

Installation & Setup

Overview

This section provides the following information:

- Quick setup instructions
- Source connections
- A look inside the controller and how hardware components are wired together

2.1 Quick Start

Before you begin installation and setup of the controller it is recommended that you become familiar with the components of your controller. Refer to *Section 1* for a complete overview of the components and where they are located.

STEP 1 – Connect keyboard and mouse

1) Connect the keyboard and mouse to the PS/2 Y adapter.

2) Connect this adapter to the PS/2 port on the back of the controller (located on the SBC board).

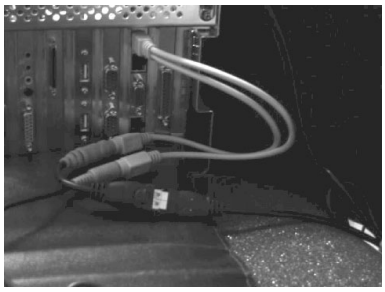


Figure 2.1.

Step 2 – Connect Display Devices

Each system comes standard with one Quad VGA cable and *Display*MASTER module, but can be customized to hold up to 6 *Display*MASTER modules. For each *Display*MASTER module you have in your system you can connect up to 4 display devices. The system will detect any display device not connected during the boot up process.

1) Connect the 44-pin end of the Quad VGA cable to the *Display*MASTER module on the back of the FRC.

2) Connect the other 4 ends of the Quad VGA cable to your display devices. The manner in which you connect each cable end should reflect how you desire to number your display devices. By software default, numbering occurs from the top left of the display wall and continues across each row and down. The numbering pattern can be changed to start from top left continuing down each column and then across, however this also requires a re-install of the FRC drivers from the MASTER*Suite* software files. See *Section 8: Software Installation*).

Figure 2.2. illustrates the two methods available for display wall numbering.

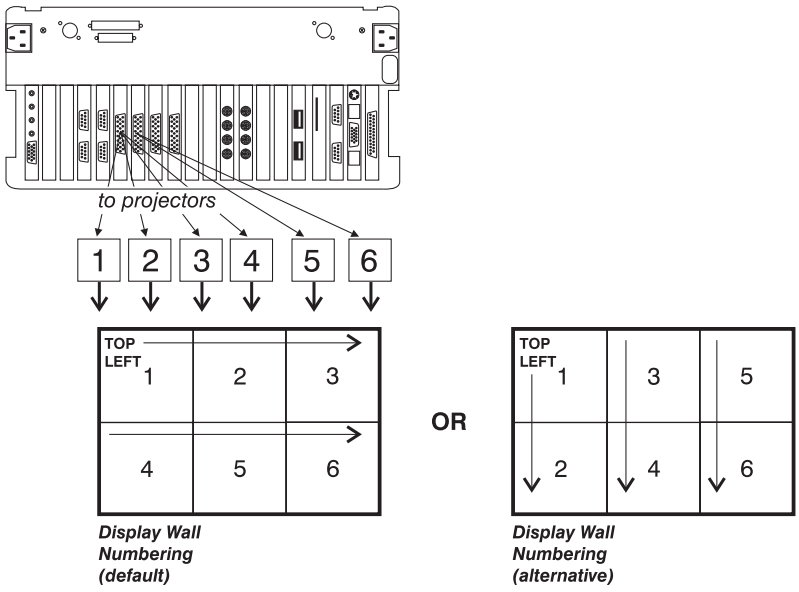


Figure 2.2. Display Wall Numbering

Display Device	Display Card	Cable
1	1	A
2	1	B
3	1	C
4	1	D
5	2	A
6	2	B
7	2	C
8	2	D
9	3	A
10	3	B
11	3	C
12	3	D
13	4	A
14	4	B
15	4	C
16	4	D
17	5	A
18	5	B
19	5	C
20	5	D
21	6	A
22	6	B
23	6	C
24	6	D

Figure 2.3. Display Wall Cabling

Step 3 – Connect Ethernet (if connecting to a network)

Connect the CAT5 cable to the RJ45 connector located on the rear panel.

Step 4 – Connect Video Sources

Connect source cables to the appropriate video modules (VideoMASTER Switch, VideoMAX and VIM). See *2.3 Source Connections*.

Step 5 – Connect RGB Sources

Connect a VGA cable with an HD-15 connector to RGB modules. See *2.3 Source Connections.*

Step 6 – Connect AC Power Cords

Connect the controller's line cords (2) to the AC receptacles located in the top left and right corners (front panel) and to proper AC. The input power required is 100-240VAC.

Step 7 – Power ON the FRC

See *2.2 Powering ON/OFF*.

Step 8 – For XP only (first time use)

When you start the controller (with XP) for the first time you may be prompted through a series of introductory screens to configure your controller. Follow the instructions on each screen before continuing to the next.

Step 9 – Continue with normal operation.

See *Section 4* on how to configure your display wall and *Section 5 – 8* for specific software applications.

2.2 Powering ON/OFF

Before powering up the FRC-5000 controller

The controller has four power supply modules that can be accessed from the front panel. Each of these modules is equipped with an on/off switch. Turn each power supply ON before turning the controller's master power switch on. Keep these modules ON during normal operation of the controller.

Powering ON

1) Turn the master power switch, located in the top left corner on the front panel, to the ON position. At this time the system will begin to cycle through its initialization and boot process (approximately 2 minutes).

Initialization Process

The following sequence of events will occur immediately upon powering up your controller:

- System will release one long "beep".
- Power supply LED's will change from orange to green.
- LED panel will cycle through chassis hardware component check.
- Screen 1 (first display device) will display boot process. Depending on your display device capabilities you may or may not see the boot up process (resolution of boot sequence is 640x480)
- Windows XP/2000 login screen appears

NOTE 1: For each *Display*MASTER output not plugged into a display device, the FRC will emit 1 long beep followed by 2 short beeps during the boot process.

NOTE 2: If the controller emits one continuous "beep", it indicates that one of the system alarms has been triggered or a possible RAID problem. Refer to *Section 3 – System Alarm Monitoring* for details.

⚠ *Powering OFF*

The controller should always be powered off and unplugged whenever it requires servicing or whenever a module requires replacement. You should never remove the top cover of the controller with the power on.

To power off the controller:
Shutdown Windows and turn the main power switch, on the front panel, to the OFF position. Unplug the line cord from the wall outlet prior to servicing.

NOTE: The power switch to each power supply modules can be left in the ON position when powering down the controller. Only when the power supply is to be swapped out of the system should the power switch be turned to the OFF position.

2.3. Source Connections

All source connections are made to the connectors found on the controller's rear input panel. The number of optional input modules, such as VideoMASTER Switch, VideoMAX and RGBMASTER can vary, depending on your intended application. The number of standard modules in a system (*Display*MASTER and Video Input Modules) can also vary.

The second-half of this section, *Installing Input Modules: Wiring and Hardware* describes how the modules are wired internally for the most common module configurations.

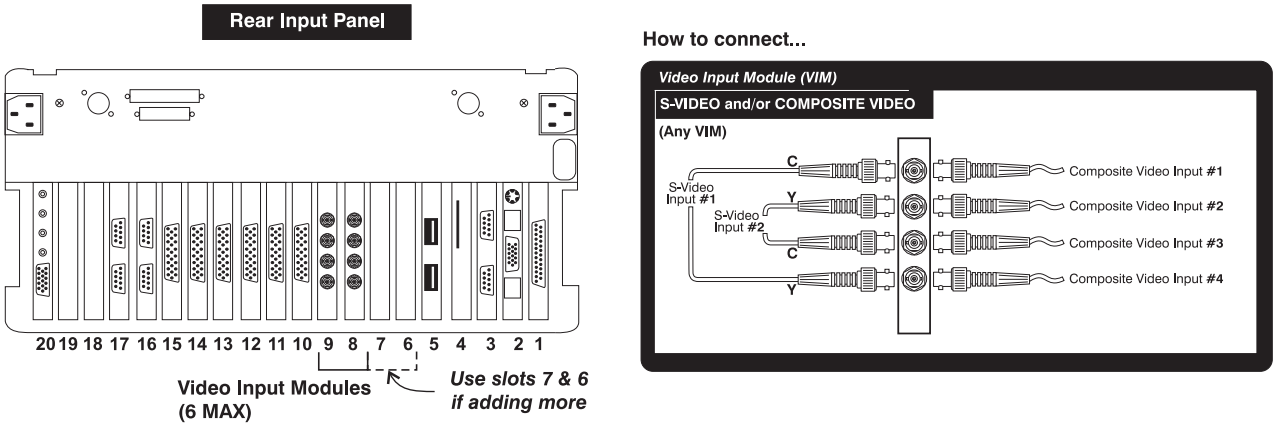
Composite or S-Video Sources

Connecting to the Video Input Module (VIM)

Composite and/or s-video sources can be connected to the controller using the connectors available on the Video Input Module (VIM). Each controller comes standard with one VIM, but can be modified to include multiple VIMs (**up to a maximum of 6**), which will provide the capability of displaying multiple composite or s-video sources.

NOTE: If you have VideoMAX or VideoSwitch input modules installed VIM is not available.

When one VIM is installed you have the capability of displaying up to 4 composite or 2 S-video sources anywhere on the display wall. If needed, you can connect both source types on a single VIM—i.e., you can connect one S-video and two composite video sources on a single VIM. Figure 2.4. shows how to connect s-video and composite video. Each input is numbered and can be selected from software. The image you display will depend on which input source is selected and where the input window appears on the wall.



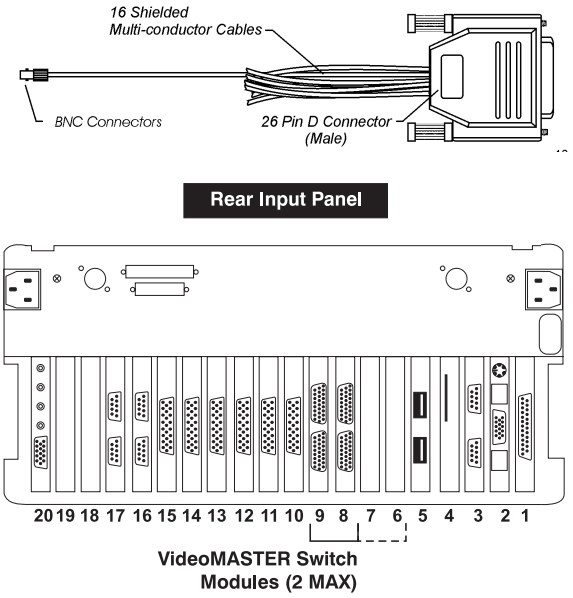
NOTE: VIMs in general can be installed in any available slot (from Slot #6 to Slot #19). The illustration shows a system with 6 DisplayMASTER modules with VIMs to the right.

Figure 2.4. Connecting Video Sources to a Video Input Module

Connecting to the VideoMASTER Switch Module (VSM)

The VSM is an optional input module that can be installed into the controller to provide composite and s-video connections. A **maximum of 2** VSMs can be installed in the system.

To connect to a VSM module you need a 16 BNC breakout cable. Connect the cable to the top D-Sub connector on the VSM. If you have two VSMs installed in your controller the VSM furthest to the left is considered module 1. Refer to Figure 2.5 for connection of composite and s-videos sources to VideoMASTER modules.



NOTE: Slots 6-9 are also used for VideoMAX/Video Input Modules or Quad Ethernet Modules.

How to connect...

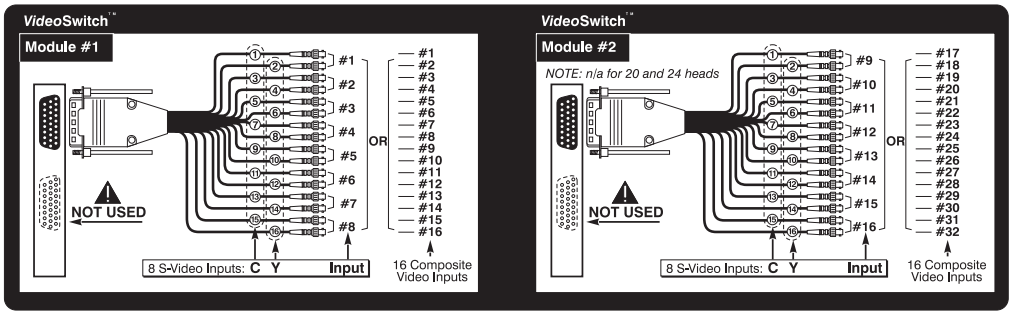


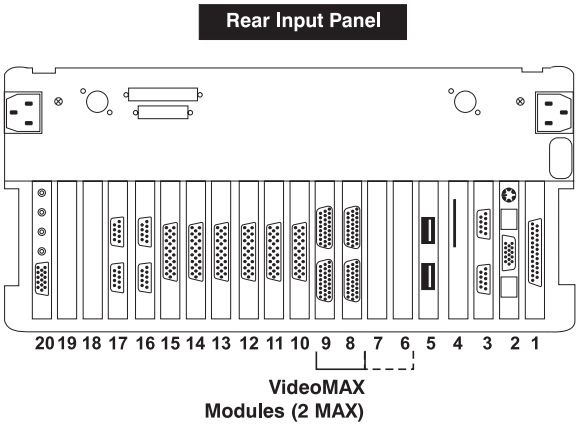
Figure 2.5. Connecting composite/s-video sources to VideoMASTER modules

Connecting to the VideoMAX Module

The VideoMAX module is another optional input module that can be installed into the controller. This module has nine decoders built in. Each decoder has two inputs, A and B of which only one can be viewed at any given time. The VideoMAX module allows 18 video sources to be connected and 9 of them to be displayed simultaneously on a display wall. A **maximum of 2** VideoMAX modules can be installed in the system.

NOTE: To view multiple videos on any given display, the video sources must be connected to a single VideoMAX module. For example, only one VideoMAX can drive a display at any given time.

The way in which video is distributed is directly related to the way the modules are wired internally. Refer to *2.4 Installing Input Modules: Wiring and Hardware* when doing so.



NOTE: Slots 6-9 are also used for VideoMASTER Switch Modules/ Video Input Modules or Quad Ethernet Modules.

How to connect...

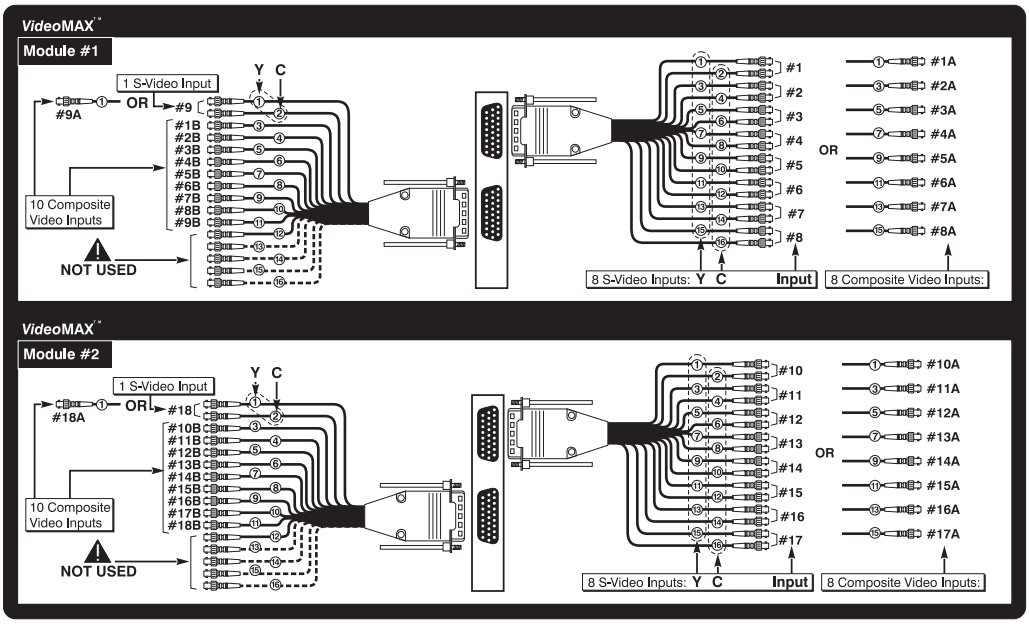


Figure 2.6. Connecting video sources to VideoMAX modules

RGB Sources

RGB sources can be connected to the optional RGBMASTER modules. A **maximum of 4** optional RGBMASTER modules can be installed in the system. Looking at the controller from the rear, the RGBMASTER modules are located to the right of the *Display*MASTER modules – the left most RGBMASTER module is considered module 1. Each RGBMASTER module has two connectors with the top one numbered as input 1. See Figure 2.7. for module location and complete input numbering details.

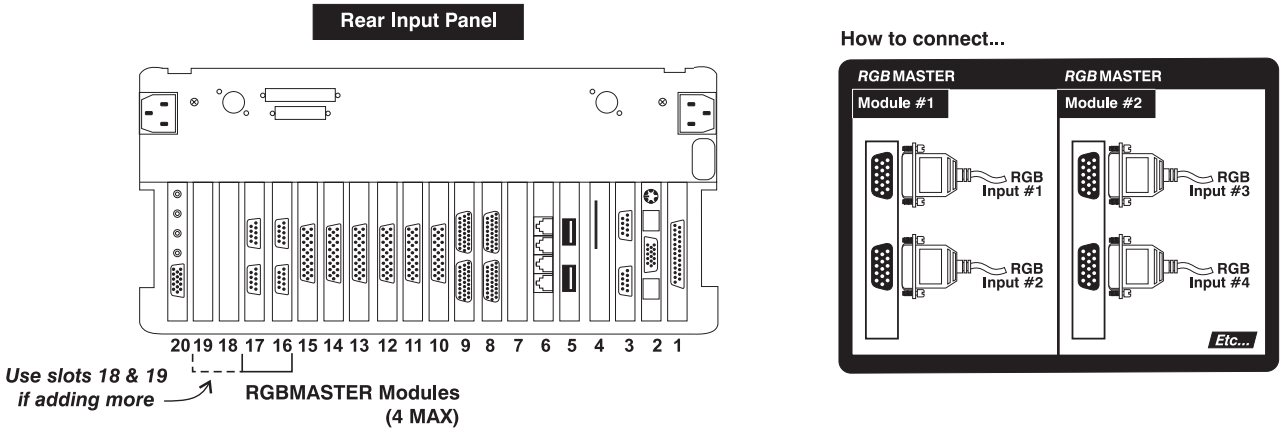


Figure 2.7. Connecting RGB sources to RGBMASTER modules

2.4. Installing Input Modules: Wiring and Hardware

This sub-section provides a look inside the controller and provides instructions on how to install new input modules. *NOTES:1) All illustrations are top views, looking at the controller from the front. 2) RGBMASTER modules do not require any internal wiring.*

CAUTION

Do not twist ribbon cables when connecting modules.

Installing Video Input Modules (VIMs)

Single VIM

A single VIM can support the connection of up to 6 *Display*MASTER modules using the long ribbon cable with 6 connectors. This ribbon cable connects to the jumper on the *Display*MASTER module labeled J3. See Figure 2.8. (*shows connection to 4 DisplayMASTER modules*)

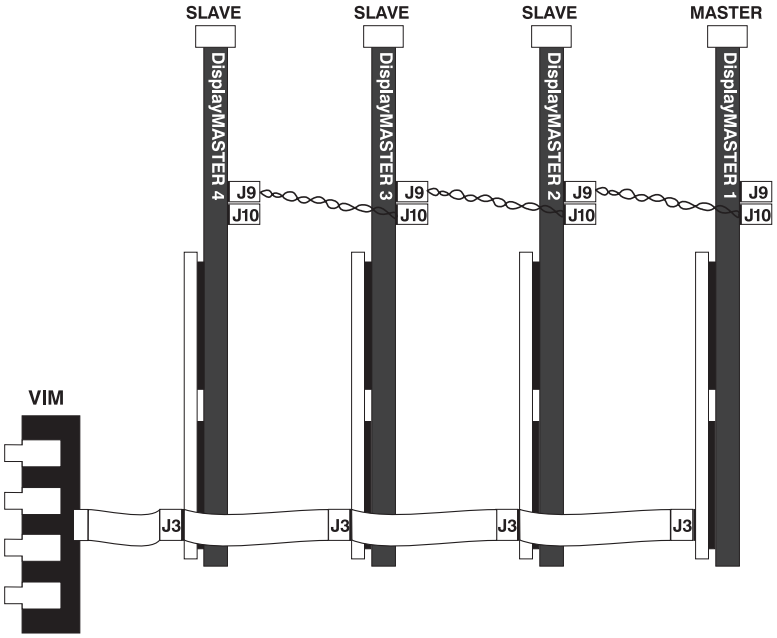


Figure 2.8. Connecting a single VIM to four DisplayMASTER Modules

Multiple VIMs

Mulitple VIMs can be installed into the controller to allow for a maximum of 1 video input per display device. The limitation is that each video input source can only be viewed on the displays to which the video has been distributed.

To distribute video across the display wall using multiple VIMs, connect the ribbon cable from the VIM to the jumper labeled J3 on each *Display*MASTER module. Only one VIM can be connected to a *Display*MASTER module at any time.

Installing VideoMASTER Switch Modules (VSM)

The VSM can be configured in one of three ways depending on how the modules were wired internally. *NOTE: In each of the three configurations, you are limited to displaying one video per display device.*

- ***Single VideoMASTER Switch module connected to 4 DisplayMASTER modules (1 to16 screens):*** This configuration allows for 16 composite / 8 S-video inputs to be displayed anywhere across the display wall (1 video per display device limitation).

- ***2 VideoMASTER Switch modules connected to 4 DisplayMASTER modules (1 to 16 screens):*** This configuration allows for 32 composite / 16 S-video inputs to be displayed anywhere across the display wall (1 video per display device limitation).

- ***2 VideoMASTER Switch modules connected to 6 DisplayMASTER modules (1 to 24 screens):*** This configuration allows for 16 composite / 8 S-Video inputs to be displayed anywhere across the display wall (1 video per display device limitation).

Connecting a single VSM to 4 DisplayMASTER modules

A single VSM can be connected to up to 4 *Display*MASTER modules using ribbon cables with 2 connectors. One ribbon cable required per connection. See Figure 2.9.

1) Connect J6 from the VSM to J3 on *Display*MASTER module #1 (module furthest from the VSM).
2) Connect J7 from the VSM to J3 on *Display*MASTER module #2.
3) Connect J8 from the VSM to J3 on *Display*MASTER module #3.
4) Connect J9 from the VSM to J3 on *Display*MASTER module #4 (module closest to the VSM).
5) Starting with the *Display*MASTER module closest to the VSM, connect the jumper J9 to J10 on the next module and connect J9 from that module to J10 on the next and so on until all *Display*MASTER modules are connected.

No modification to jumper links required on the VSM in the following configuration.

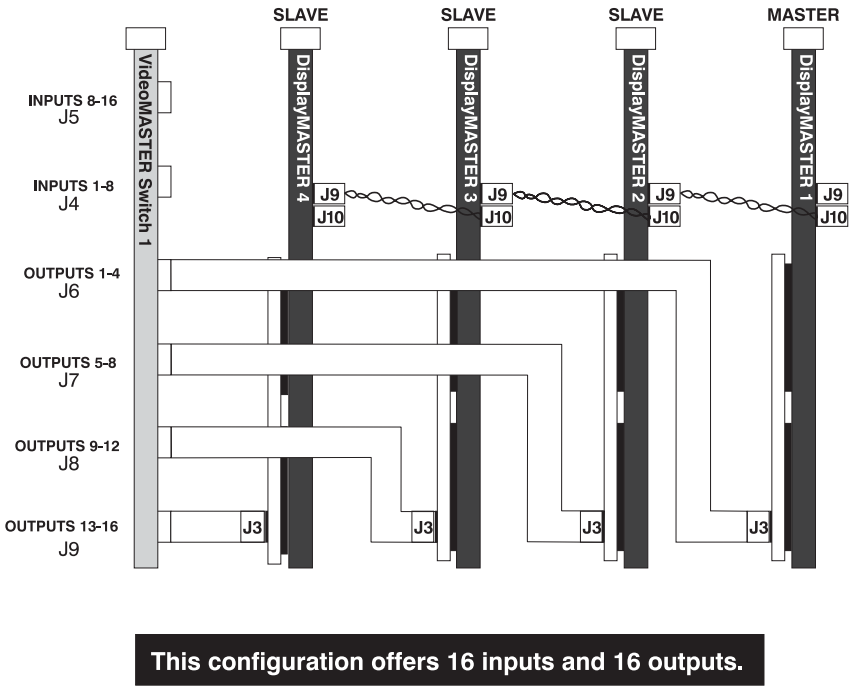


Figure 2.9. Connect a single VSM to 1-4 DisplayMASTER modules

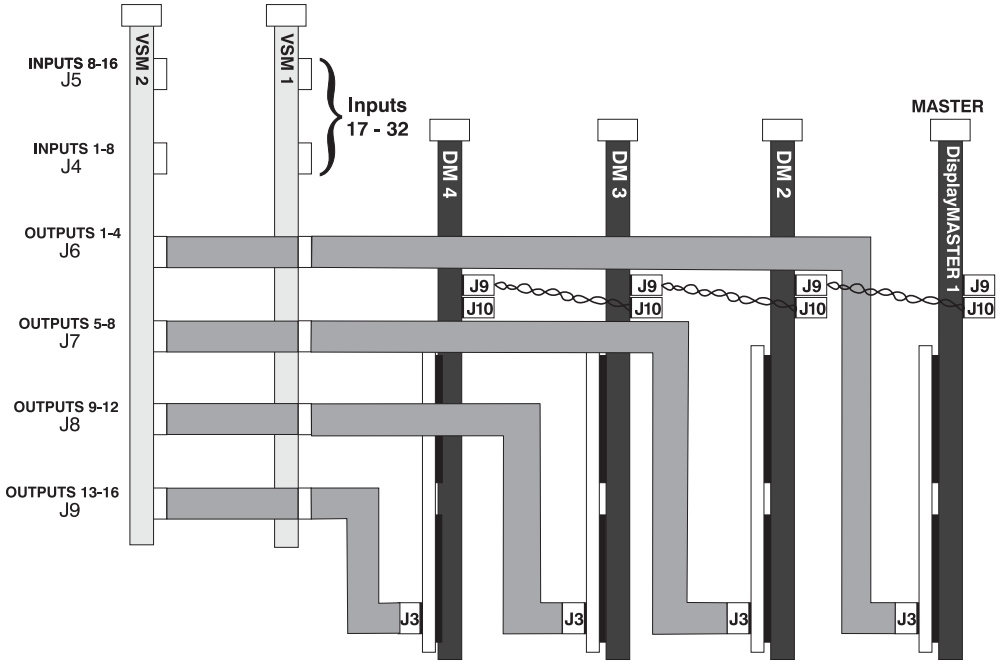
Connecting 2 VSMs to 4 DisplayMASTER modules

When you are connecting two VSMs to multiple *Display*MASTER modules you must use a ribbon cable with 3 connectors. VSM #1 and VSM #2 are connected together before being connected to the *Display*MASTER modules. The VSM closest to the *Display*MASTER modules is #1. See Figure 2.10.

NOTE: The two VSMs must be connected even if the controller does not have 4 DisplayMASTER modules installed.

1) Connect J6 from VSM#2 to J6 VSM#1 and to J3 on *Display*MASTER #1 (module furthest from VSM#1).
2) Connect J7 from VSM#2 to J7 VSM#1 and to J3 on *Display*MASTER #2.
3) Connect J8 from VSM#2 to J8 VSM#1 and to J3 on *Display*MASTER #3.
4) Connect J9 from VSM#2 to J9 VSM#1 and to J3 on *Display*MASTER #4.
5) Starting with the *Display*MASTER module closest to the VSM, connect the jumper J9 to J10 on the next module and connect J9 from that module to J10 on the next and so on until all *Display*MASTER modules are connected.

Before installing VSM modules in the following configuration, make sure to open (remove) jumper links LK17 to LK32.



This configuration offers 32 inputs and 16 outputs.

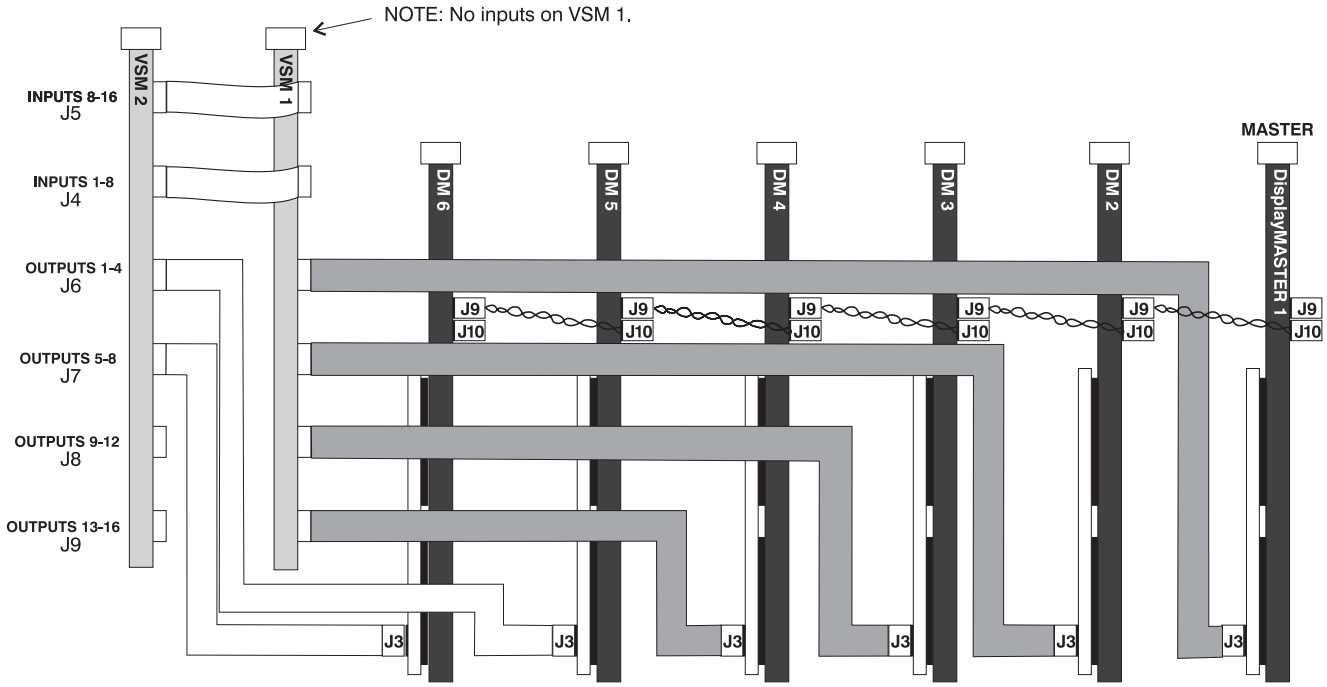
Figure 2.10. Connecting 2 VSMs to 1-4 DisplayMASTER modules

Connecting 2 VSMs to 6 DisplayMASTER modules

When you are connecting two VSMs to multiple *Display*MASTER modules you must use a ribbon cable with 2 connectors. See Figure 2.11.

1) Connect J4 from VSM#2 to J4 on VSM#1.
2) Connect J5 from VSM#2 to J5 on VSM#1.
3) Connect J6 from VSM#1 to J3 on *Display*MASTER #1.
4) Connect J7 from VSM#1 to J3 on *Display*MASTER #2.
5) Connect J8 from VSM#1 to J3 on *Display*MASTER #3.
6) Connect J9 from VSM #1 to J3 on *Display*MASTER #4.
7) Connect J6 from VSM#2 to J3 on *Display*MASTER #5.
8) Connect J7 from VSM#2 to J3 on *Display*MASTER #6.
6) Starting with the *Display*MASTER module closest to the VSM, connect the jumper J9 to J10 on the next module and connect J9 from that module to J10 on the next and so on until all *Display*MASTER modules are connected.

Before installing VSM modules in the following configuration, make sure to open (remove) jumper links LK1 to LK16.



This configuration offers 16 inputs and 24 outputs.

Figure 2.11. Connecting 2 VSMs to 6 DisplayMASTER modules

Table 2.1. VideoMASTER Switch Input Cabling Chart

Composite Input	S-Video Input	VideoSwitch Module No.	Cable Number
1	Chroma 1	1	1
2	Luma 1	1	2
3	Chroma 2	1	3
4	Luma 2	1	4
5	Chroma 3	1	5
6	Luma 3	1	6
7	Chroma 4	1	7
8	Luma 4	1	8
9	Chroma 5	1	9
10	Luma 5	1	10
11	Chroma 6	1	11
12	Luma 6	1	12
13	Chroma 7	1	13
14	Luma 7	1	14
15	Chroma 8	1	15
16	Luma 8	1	16
17	Chroma 9	2	1
18	Luma 9	2	2
19	Chroma 10	2	3
20	Luma 10	2	4
21	Chroma 11	2	5
22	Luma 11	2	6
23	Chroma 12	2	7
24	Luma 12	2	8
25	Chroma 13	2	9
26	Luma 13	2	10
27	Chroma 14	2	11
28	Luma 14	2	12
29	Chroma 15	2	13
30	Luma 15	2	14
31	Chroma 16	2	15
32	Luma 16	2	16

Installing VideoMAX Modules (VMM)

A **maximum of 2** VideoMAX modules can be installed in a controller.

The VideoMAX module can be configured in one of three ways:

- ***Single VideoMAX module connected to 4 DisplayMASTER modules:*** This configuration allows for 18 composite/ 9 S-video inputs to be connected, and 9 of those inputs can be displayed anywhere across the display wall.
- ***2 VideoMAX modules connected to 4 DisplayMASTER modules:*** This configuration allows for 36 composite / 18 S-video inputs to be connected, and 18 of those inputs can be displayed across the display wall.
- ***2 VideoMAX modules connected to 6 DisplayMASTER modules:*** This configuration allows for 36 composite / 18 S-Video inputs to be connected, and 18 of those inputs can be displayed across the display wall (video distribution dependant on internal cabling***)

Connecting 1 VMM connected to 4 DisplayMASTER modules

When you are connecting a VMM to a *Display*MASTER module you must use a ribbon cable with 5 connectors. Two separate ribbon cables come off the VMM, each connecting to a connector on the *Display*MASTER module. See Figure 2.12.

1) Connect J6 from the VMM to J7 on all *Display*MASTER modules.
2) Connect J7 from the VMM to J8 on all *Display*MASTER modules.

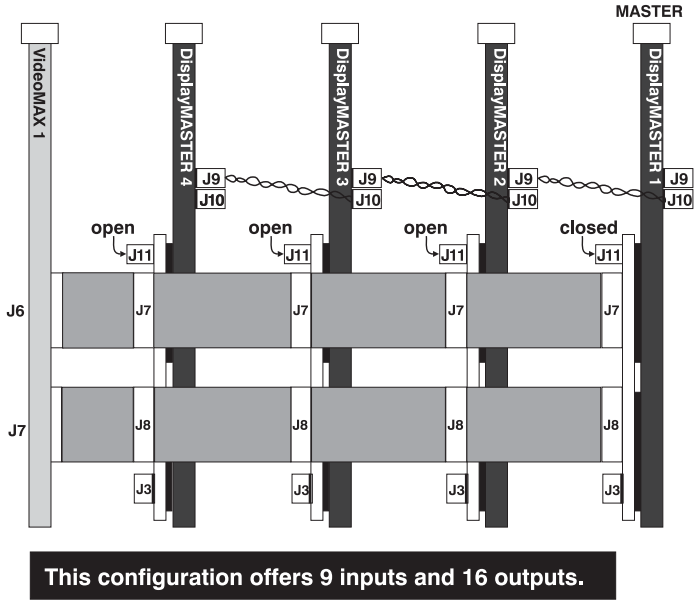


Figure 2.12. Connect 1 VMM to 4 DisplayMASTER modules

Connecting 2 VMMs to 4 DisplayMASTER modules (Figure 2.13.)

1) Connect J6 from the first VMM to J7 on all *Display*MASTER module.
2) Connect J7 from the second VMM to J8 on all *Display*MASTER modules.

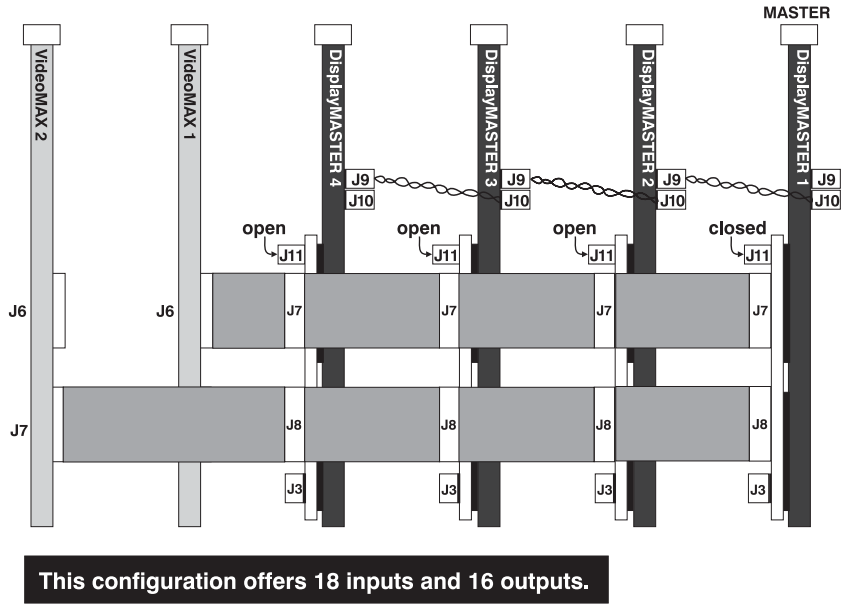


Figure 2.13. Connect 2 VMMs to 1-4 DisplayMASTER modules

Connecting 2 VMMs to 6 DisplayMASTER modules (Figure 2.14.)

1) Connect J6 from the first VMM to J7 on *Display*MASTER modules #1, #2, and #3.
2) Connect J7 from the second VMM to J8 on *Display*MASTER modules #4, #5, and #6.

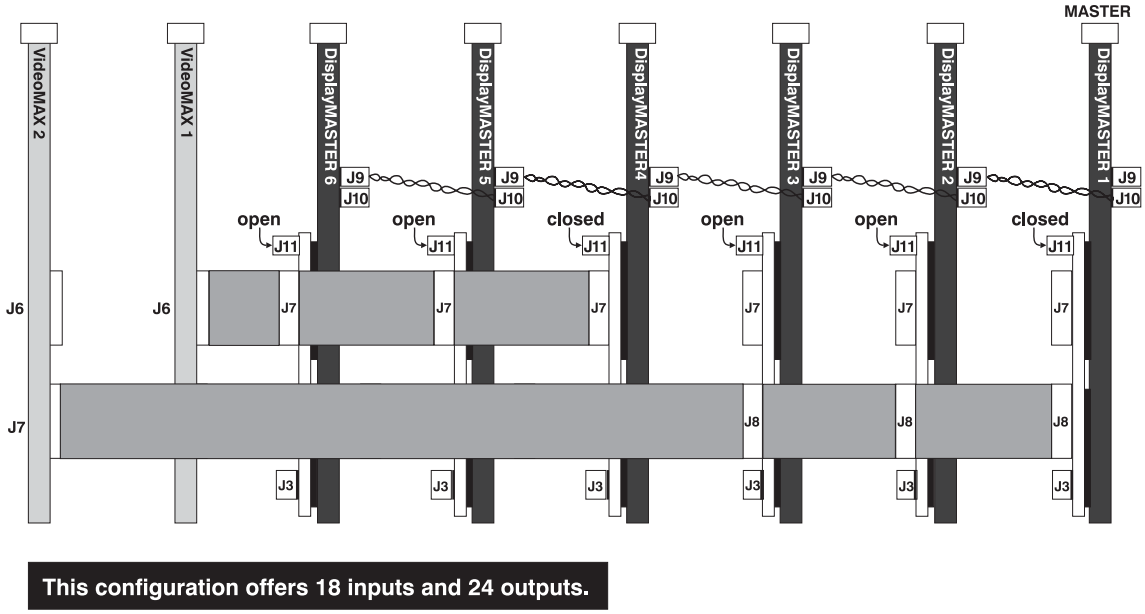


Figure 2.14. Connect 2 VMMs to 1-6 DisplayMASTER modules

Table 2.2. VideoMAX Input Connection

Composite Input	S-Video Input	VideoMax Module Number	Breakout Cable	BNC Cable Number
1A	Luma 1	1	Top	1
	Chroma 1	1	Top	2
2A	Luma 2	1	Top	3
	Chroma 2	1	Top	4
3A	Luma 3	1	Top	5
	Chroma 3	1	Top	6
4A	Luma 4	1	Top	7
	Chroma 4	1	Top	8
5A	Luma 5	1	Top	9
	Chroma 5	1	Top	10
6A	Luma 6	1	Top	11
	Chroma 6	1	Top	12
7A	Luma 7	1	Top	13
	Chroma 7	1	Top	14
8A	Luma 8	1	Top	15
	Chroma 8	1	Top	16
9A	Luma 9	1	Bottom	1
	Chroma 9	1	Bottom	2
1B		1	Bottom	3
2B		1	Bottom	4
3B		1	Bottom	5
4B		1	Bottom	6
5B		1	Bottom	7
6B		1	Bottom	8
7B		1	Bottom	9
8B		1	Bottom	10
9B		1	Bottom	11
10A	Luma 10	2	Top	1
	Chroma 10	2	Top	2
11A	Luma 11	2	Top	3
	Chroma 11	2	Top	4
12A	Luma 12	2	Top	5
	Chroma 12	2	Top	6
13A	Luma 13	2	Top	7
	Chroma 13	2	Top	8
14A	Luma 14	2	Top	9
	Chroma 14	2	Top	10
15A	Luma 15	2	Top	11
	Chroma 15	2	Top	12
16A	Luma 16	2	Top	13
	Chroma 16	2	Top	14
17A	Luma 17	2	Top	15
	Chroma 17	2	Top	16
18A	Luma 18	2	Bottom	1
	Chroma 18	2	Bottom	2
10B		2	Bottom	3
11B		2	Bottom	4
12B		2	Bottom	5
13B		2	Bottom	6
14B		2	Bottom	7
15B		2	Bottom	8
16B		2	Bottom	9
17B		2	Bottom	10
18B		2	Bottom	11

Section 3

System Alarm Monitoring

3.1 About the Alarm Monitoring System

The FRC-5000 is equipped with an alarm monitoring system. If a failure is detected with one of the chassis components, the SCSI drives and/or the temperature of the CPU, the system will respond by sending out an audible alarm and illuminating an LED on the front panel. See Figure 3.1.

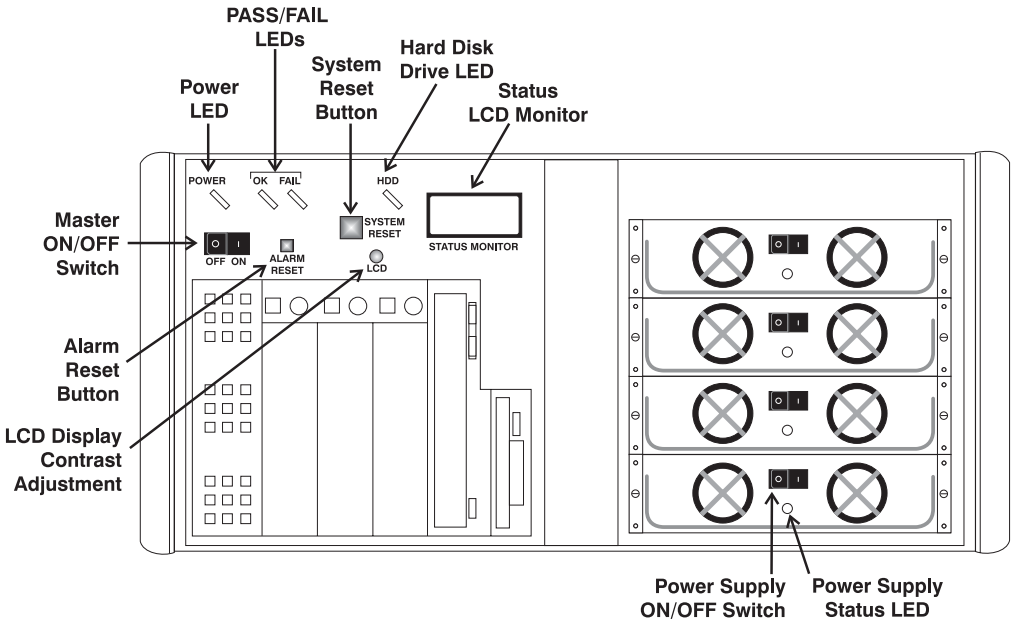


Figure 3.1. Front Panel – Status Monitoring System

Monitoring Chassis Components

When the controller is first powered up and continuously throughout operation, chassis components are monitored by the alarm monitoring system. The two LEDS labeled OK and FAIL on the main input panel illuminate to indicate the status of components. The OK LED illuminates green and the FAIL LED illuminates red. The two LEDS will alternately illuminate in the event a failure is detected.

The following chassis components are monitored by the alarm monitoring system:

- **Beginning of cycle**
- **Power Supply 1** (Pass / Fail): A failure indicates that one or more power supplies are no longer working. To identify the faulty power supply module look for the orange LED on its front panel.
- **Supply 1 Fan** (Pass / Fail): A failure indicates that the cooling fan for the power supply is not working properly and must be replaced.
- **MBM Fan 1** (Pass / Fail): If the RPM of the fan is lower than 2,000 RPM it will trigger a failure. Fan 1 is on the left side of the chassis.
- **MBM Fan 2** (Pass / Fail): If the RPM of the fan is lower than 2,000 RPM it will trigger a failure. Fan 2 is the middle fan.
- **MBM Fan 3** (Pass / Fail): If the RPM of the fan is lower than 2,000 RPM it will trigger a failure. Fan 3 is on the right side of the chassis.
- **Drive Bays Temp** (Pass / Fail): This monitors the temperature at the front of the chassis and will give a failure if the temperature exceeds 70°C
- **Main Board Temp** (Pass / Fail): This monitors the temperature at the rear of the chassis and will give a failure if the temperature exceeds 70°C

Turning the Alarm Off

To turn off the alarm triggered by a chassis component failure, press the ALARM RESET button on the front input panel. The FAIL LED will continue to flash until the faulty module has been replaced, and the ALARM RESET button is pressed again.

Monitoring Hard Disk Drives

HDD Failure (in RAID array)

If your system has been setup with RAID and one of the hard drives fails, the SCSI Raid Controller will emit an audible alarm and the HDD LED will illuminate red. To determine which hard drive has failed, you must enter the SCSI BIOS or run the Adaptec management pro software (provided with, but not installed on your FRC-5000). Once the hard drive has been replaced, you must rebuild the hard drive. Refer to the *Adaptec* manual provided with your system.

Turning the Alarm Off (HDD Failure)

To turn off the alarm triggered by a hard drive failure, run the Adaptec Management Pro software (provided with, but not installed on your FRC-5000) or reboot the system and enter the SCSI BIOS (need a multi sync display device for this). Click on **Silence Alarm**.

Monitoring CPU Temperature

Reset Alarm (CPU)

If the CPU temperature exceeds 70°C an audible alarm will sound. This will continue until the CPU temperature is brought below 70°C.

Section 4

*Display*MASTER™

Overview

*Display*MASTER allows you to customize your display configuration by specifying the following parameters: number and configuration of screens, resolution, color depth and refresh rate of your display.

4.1 *Using DisplayMASTER Software*

⚠ WARNING

Before changing any screen settings, close down all *Media*MASTER (RGB/Video) windows. If these settings are changed while RGB or Video windows are displayed, the system will show artifacts or unpredictable behavior until the system is rebooted.

Start DisplayMASTER

1) Right click on the desktop and select **Properties**.
2) Click on **Settings**.
3) Click on **Advanced**.
4) Select the ***Display*MASTER** tab to access the *Display*MASTER window. (Figure 4.1.)

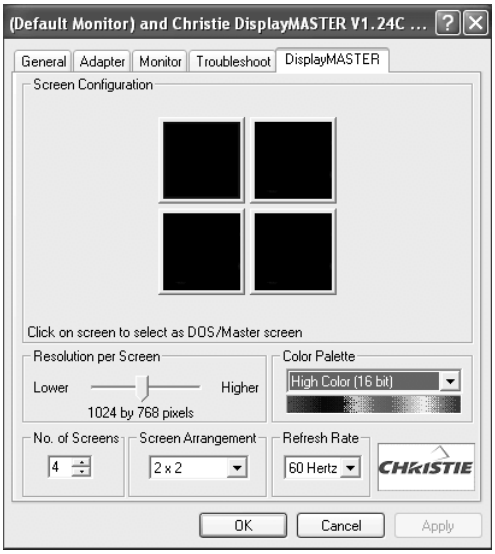


Figure 4.1. DisplayMASTER Window

Modify Display Configuration

The *Display*MASTER window is divided into several sections enabling you to customize the way you view your display.

Changing screen configuration

Change the display screen configuration by selecting the **Screen Arrangement** drop down menu. All the possible configurations for the number of screens you entered in the field **No. of Screens** will be available for you to select.

NOTE: The FRC-5000 must be configured in a rectangular array.

Changing number of screens in a display

Change the number of screens in your display by entering a value or click on the up/down arrows in the **No. of Screens** field. The value entered depends on the number of *Display*MASTER modules installed in your FRC-5000 system. Each *Display*MASTER module can handle up to 4 screens. The maximum number of *Display*MASTER modules any system can have is 6, making the maximum number of screens handled 24. It is important that the value does not exceed the hardware limitations of your system. If this value is set beyond the capabilities of your hardware, the system will display as a 1 x 1.
As you change the value of **No. of Screens**, the picture shown under **Screen Configuration** will change automatically.

Note: If you increase the number of screens beyond what was configured at the time when the system is booted, you will be asked to reboot the system before the changes take place. This is because the operating system initializes only the used adapters.

Changing resolution

Set the resolution that each adapter will output by adjusting the **Resolution per Screen** slidebar. This should be set to the resolution expected by the display devices. The system can output the following VESA standards: 640 x 480; 800 x 600; 1024 x 768; 1280 x 1024 and 1600 x 1200.

Changing refresh rate

Select the refresh frequency of the system by selecting a value from the **Refresh Rate** drop down menu. This should be set to the frequency expected by the display device. The refresh rates available depend on the resolution selected and correspond to the VESA standards.

Changing Color Depth

Modify the color depth used by the system by selecting choices from the **Color Palette** drop down menu. The choices are 8bpp, 16bpp (recommended) or 24bpp.

Section 5

*Media*MASTER™

(RGB/Video Viewer)

Overview

*Media*MASTER is a software application specifically designed for viewing video and RGB sources. You can perform, modify or select any of the following using *Media*MASTER:

- select an input source to display (depends on the input modules installed in your system)
- save customized input settings as a *Profile* for a commonly used input
- modify *Media*MASTER window display settings
- save "snapshots" of current images displayed in *Media*MASTER
- access *Media*MASTER help

5.1 Using *Media*MASTER Software

The *Media*MASTER main window is composed of six options, consisting of drop down menus (**Profiles, Language** and **Help**) and dialog boxes (*Input Settings, Window Preferences* and *Content Capture*). You can select one of these options from the top menu bar or by right-clicking the mouse anywhere in the *Media*MASTER window and highlighting the option you want.

Any changes made to the options in the dialog boxes will be seen immediately. To accept the changes made and return to the main *Media*MASTER window, you must click on the **OK** button located at the bottom of the window. To cancel any changes you made in these windows and to return to previous settings, select **Cancel**.

*Start Media*MASTER

To start *Media*MASTER, double-click on the *Media*MASTER icon located on the desktop OR navigate through the start menu: **Start** ⇒ **Programs** ⇒ **Christie** ⇒ ***Media*MASTER**. The *Media*MASTER default window will appear, which is configured to display Channel 1 Video Input on Screen 1.

NOTES: 1) To display other sources in the MediaMASTER window see 5.3 Input Settings. 2) To start MediaMASTER with an input other than the default, see 5.2 Profiles.

*Accessing Media*MASTER *Options*

' To select any of the six *Media*MASTER options use the top menu bar (shown on the left in Figure 5.1.) or using the mouse, right click anywhere in the window and select the option from the "right-click" menu (shown on right).

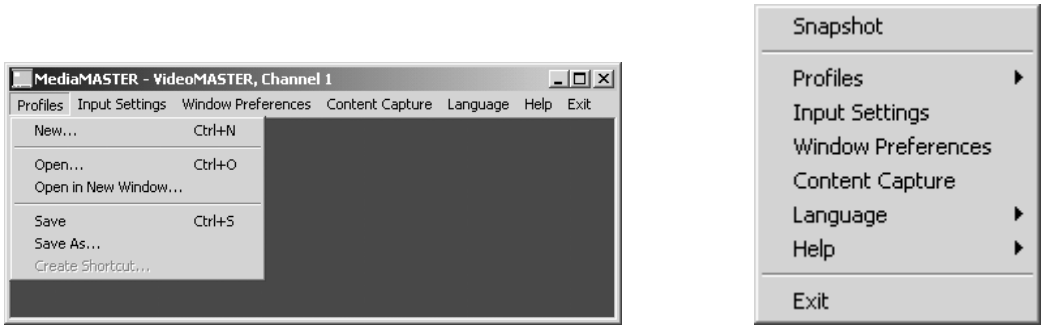


Figure 5.1. Accessing Media*MASTER *options

*Exit Media*MASTER

' To close and exit *Media*MASTER, select **Exit** from the top menu bar or using the mouse, right click in the window and select **Exit.** You can also select ⊠ from the title bar.

*Moving a Media*MASTER *Window*

' The *Media*MASTER window can be moved to another location by applying and holding a left click (with the PC mouse) anywhere inside the window or on the titlebar and moving it to a new location. When you click inside the *Media*MASTER window the cursor will turn into a 4-pointed arrow (Figure 5.2.) to indicate that the window can be moved.

If **Lock Position** is enabled (U) in the *Window Preferences* dialog box, then the cursor will not change and you will not be able to move the *Media*MASTER window.

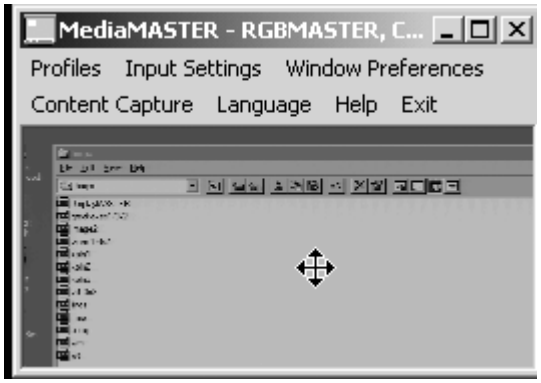


Figure 5.2. Move window cursor icon

*Resizing a Media*MASTER *Window*

' To resize a *Media*MASTER window, apply and hold a left click on the window border. Move the mouse button to resize the window.

If **Lock Size** is enabled (U) or the window style is set to **Bare** you will not be able to resize the window.

5.2 Profiles

What is a Profile?

Profiles are saved input settings for a specific source. They allow you to quickly select a specific input device (RGB/Video), channel and all the input settings associated with that device. Profiles are set by the user and saved on the system hard drive. The number of profiles one can create is determined by the memory available on the hard drive.

The benefit of creating profiles is that it allows you to change your display wall layout quickly without having to set the various input settings for an input device that you use often.

This section explains how to create, customize and use profiles.

Accessing the Profiles menu

' To access the **Profiles** drop down menu, select **Profiles** from the menu bar or using the mouse right click anywhere in the *Media*MASTER window and highlight the option **Profiles**. (Figure 5.3.)

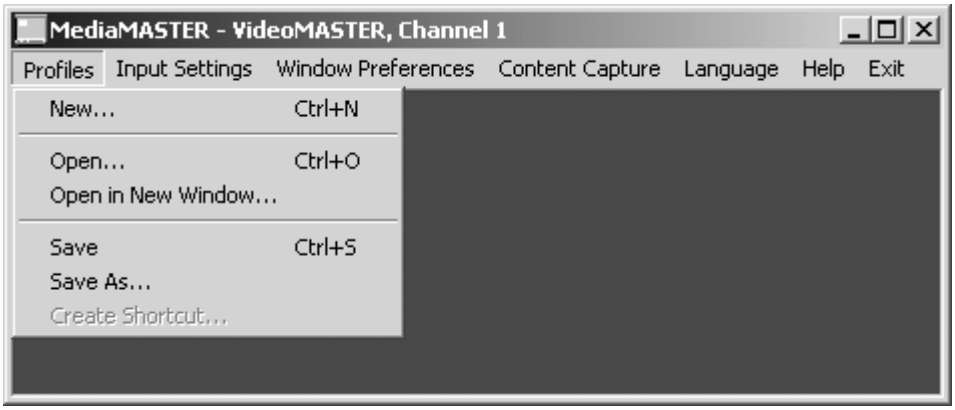


Figure 5.3. Accessing Profiles Menu

Creating a Profile

' Profiles can be created in two ways. You can use the Profile Wizard or you can save the current *Media*MASTER window and all of its current settings.

Using the Profile Wizard:

1) Click on **Profiles** ⇒**New…** from the *Media*MASTER menu bar. The *Input Settings* dialog box appears.

2) Modify the options in *Input Settings* for the device and channel you are using. Click **Next** to accept the changes you made in *Input Settings* and to advance to the next screen, which is the *Window Preferences* dialog box.

3) Modify the options in *Window Preferences*, such as window size and position. Click **Next** to accept changes and advance to the next screen, which is the *Content Capture* dialog box.

4) Modify the options in *Content Capture* and click **Next**.

5) Specify a profile name (create your own) and the directory in which to store it. The default directory is *Install Directory\MyProfiles.*

6) Click **Save.**

7) *Media*MASTER now loads the created profile.

Saving the current MediaMASTER window as a Profile

1) Configure your *Media*MASTER window on the display wall. Make sure the proper content is being displayed and the window properties are correct.
2) Click **Profiles** ⇒ **Save As…**
3) Specify a profile name and the directory in which to store it. The default directory is *Install Directory\MyProfiles.*
4) Click **Save**.

Selecting a Profile

Click **Profiles** ⇒ **Open …** to select and open a profile in the current *Media*MASTER window or click **Profiles** ⇒ **Open in New Window**… to open the profile in a new *Media*MASTER window.

Modifying a Profile

You can modify and/or overwrite an existing profile by doing the following:

1) Open a *Media*MASTER window with the profile that you want to modify.
2) Modify the settings in the *Input Settings, Window Preferences, Content Capture* dialog boxes.
3) Click **Profiles** ⇒ **Save** to overwrite the existing profile with new settings or click **Profiles** ⇒ **Save as…** to create a new profile with these new settings (specify a new profile name).

Creating a Profile Shortcut (desktop shortcut)

A desktop shortcut can be created to launch a *Media*MASTER window using a profile.

1) Open the desired profile in a *Media*MASTER window.
2) From the menu bar, click **Profiles** ⇒ **Create Shortcut…**
3) Specify a name and location for the shortcut. (Default location: Desktop)
4) Click **Save**.

5.3 Input Settings

The *Input Settings* dialog box allows you to select a signal based on input type and device. It also enables you to modify various image settings for the signal you have selected. *NOTE: The settings available for image adjustment are dependent on whether the signal is Video or RGB.*

Access the Input Settings Window

Input Settings can be selected from the *Media*MASTER menu bar or the right click menu. The dialog box will differ slightly depending on the source type you have selected. See Figure 5.4. for Video and Figure 5.5. for RGB.

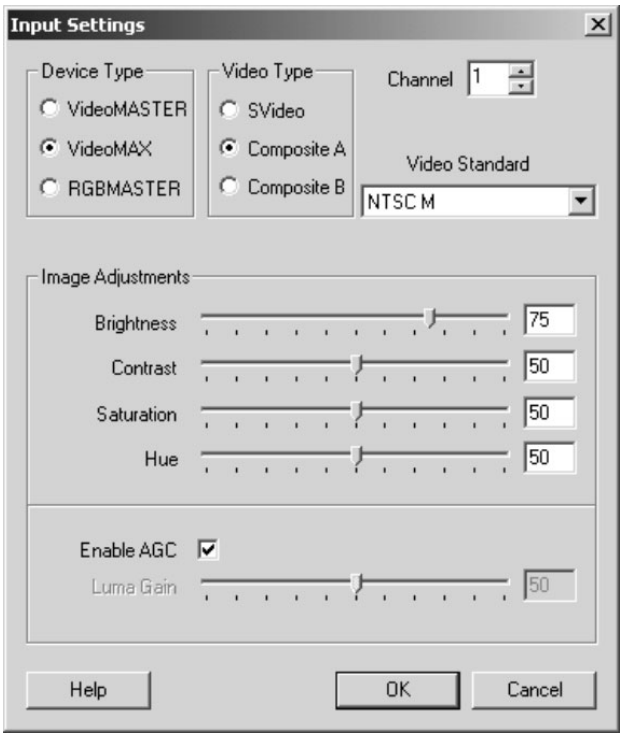


Figure 5.4. Input Settings dialog box for Video

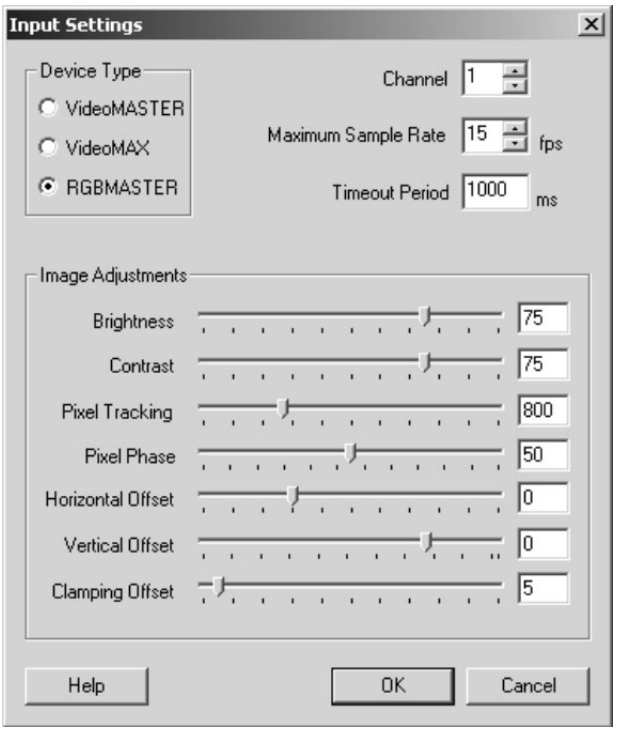


Figure 5.5. Input Settings dialog box for RGB

Selecting Device Type (Video vs. RGB device)

You can select from which device (input module) the current window will get its signal by checking off one of the device types in the *Input Settings* dialog box. (Figure 5.6.) Choose from one of the following device types:

Figure 5.6.

- ***Video*MASTER:** Selecting this device type allows you to display the video sources connected to any Video Input Module (VIM) or *Video*MASTER Switch module. (These devices support only one active video.)
- **VideoMAX:** Selecting this device type allows you to display the video sources connected to any VideoMAX module. (This device type supports multi video per display device.)
- ***RGB*MASTER:** Selecting this device type allows you to display an RGB source connected to any RGBMASTER module.

NOTES: 1)If the device is not detected in the system, the option will appear grayed out and cannot be selected. 2) Each MediaMASTER window will default to a video device. Which video device depends on what devices are detected in the system. The order of selection is VideoMAX first, then VideoMASTER.

Selecting Video Type (for Video)

You can specify which type of video signal should be displayed by selecting one of the following video types:

- **Composite A Video**: 1 BNC connector
- **Composite B Video**: 1 BNC connector, second input for VideoMAX Module
- **S-Video**: 2 BNC connectors

Default: Composite A.

Selecting Video Standard (for Video)

Select the proper video standard from the **Video Standard** drop down box. This will specify which video standard the signal has been encoded in. The various forms of NTSC, PAL and SECAM are listed. (Figure 5.7.)

Default: NTSC-M.

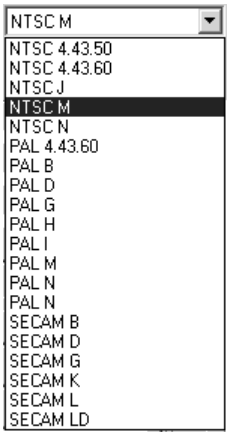


Figure 5.7.

Specifying Maximum Sample Rate (for RGB)

The **Maximum Sample Rate** specifies how quickly the RGB window will update (refresh). The range is 1 to 30. The maximum attainable refresh rate is dependent on how much bandwidth is available on the PCI bus. Setting a high sample rate will reduce bandwidth availability for other applications and other RGB windows and possibly cause irregular updates when one or more windows are open.

If you notice irregular updates or ghosting, decrease the "maximum sample rate" value until the updates occur more smoothly.

Default: 15

Specifying Timeout Period (RGB)

The **Timeout Period** specifies in milliseconds how long the window should wait to receive the next frame. If the window does not receive a frame by this time it will display a "No Signal" image in the capture window. This specifies the RGB device is not capturing any signal on this channel.

Specifying a timeout period of 0 will cause the window to display the last captured image if there is a signal loss.

Selecting Input Channel

The **Input Channel** specifies which input port on the device to use. When you try to open a window to an input that is already being used, the window will display an "input already open" image in the capture window.

Depending on the **Device Type** you have selected, the following input channels are valid:

If *Video*MASTER selected, choose:

- **4** if using a VIM module
- **1-16** if using 1 VideoMASTER Switch module
- **1-32** if 2 VideoMASTER Switch modules installed in a system with 4 or less display modules

If *Video*MAX selected, choose:

- **1-18** (you can choose between 2 video sources per decoder: Composite A/S-Video or Composite B)

If RGBMASTER selected, choose:

- **1-8** (2 channels per module)

NOTE: VideoMAX and RGBMASTER cannot have multiple windows displaying the same input channel.

Image Adjustments

The bottom half of the *Input Settings* dialog box is dedicated to image adjustment settings. You can modify the settings available by moving the arrow on the slidebar or by entering a value in the numeric box to the right. The settings that are available for adjustment depends on whether you are using Video or RGB signals. See Figure 5.4. for Video and Figure 5.5. for RGB. All image adjustment settings are described below.

Image Brightness

Adjust **Brightness** to increase or decrease the amount of black in the image.
Range: 1-100
Default: Depends on source

Image Contrast

Adjust **Contrast** to increase or decrease the perceived difference between light and dark area of your image. If contrast is set too high, the light parts of the image will lose detail and clarity. If contrast is set too low, the light areas will not be as bright as they could be and the image will be dim. Start low and increase so that whites remain bright but are not distorted or tinted, and that light areas do not become white (ie., "crushed").
Range: 1-100
Default: 50 for video, 75 for RGB

Color Saturation (Video)

Adjust **Saturation** to change the color saturation of a video image.
Range: 1-100
Default: 50

Color Hue (Video)

Adjust **Hue** to change the tint or shade of color of the video output. Only available when NTSC video standard is selected.

AGC (Video)

Enable **AGC** to activate the "automatic gain control" circuit to ensure properly bright images. AGC affects decoded video images only. Delete the checkmark if a decoded video image exhibits strange color artifacts such as stripes in highly saturated colors, indicating an incompatibility between the source and the AGC.

Luma Gain (Video)

Luma Gain is available when AGC is not enabled. Adjust the **Luma Gain** slide bar to change the brightness of video sources that display colors, which are incorrectly saturated.

Pixel Tracking (RGB)

Adjust **Pixel Tracking** to increase or decrease the frequency of the pixel sampling clock to correct consistency of the image.
Range: 0-3000
Default: Depends on Source

Pixel Phase (RGB)

Adjust **Pixel Phase** so that any shimmer disappears and the image is stable throughout.
Range: 1-100
Default: 50

Horizontal Offset (RGB)

Adjust **Horizontal Offset** to shift the image horizontally.
Range: -48-112
Default: 0

Vertical Offset (RGB)

Adjust **Vertical Offset** to shift the image vertically.
Range: -31-10
Default: 0

Clamping Offset (RGB)

Adjust **Clamping Offset** when the image displays strong horizontal streaks or appears dim. In these cases, the clamp position requires adjustment to match the timing of the incoming signal.
Range: 0-100
Default: 0

5.4 Window Preferences

The *Window Preferences* dialog box allows you to modify window-specific *Media*MASTER settings.

Accessing Windows Preferences

Window Preferences can be selected from the *Media*MASTER menu bar or the right click menu. (Figure 5.8.)

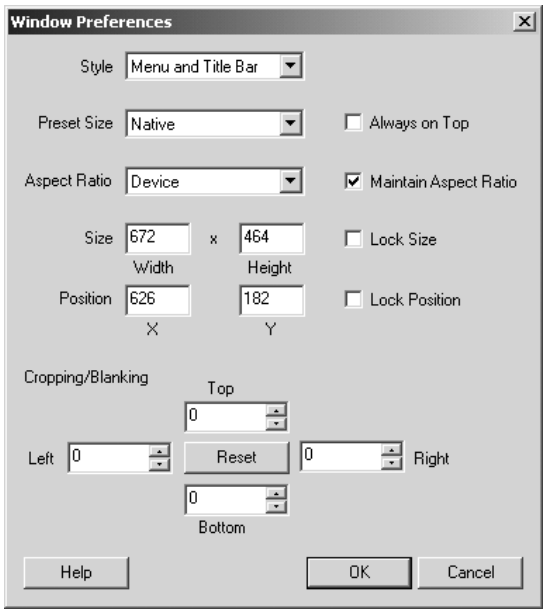


Figure 5.8. Window Preferences dialog box

Changing the Window Style

Use the **Style** drop down menu to select a window style for use with the *Media*MASTER window.

- **Menu and Title Bar:** Displays both the menu bar and title bar of the window.
- **Borders Only:** Displays a thin border around the *Media*MASTER window. Menu and title bar are not shown. Right click in the window to access menu structure.
- **Bare (No Borders):** Displays window content only (no borders). Right click in the window to access menu structure. *(Note: The window cannot be resized using the mouse.)*

Default: Menu and Title Bar.

Preset Size

Use the **Preset Size** drop down menu to select the size of the *Media*MASTER window. The **Native** or reference size is determined by the resolution of the input signal. Choose one of the following window preset sizes:

- **¼:** Scales the window content to ¼ native resolution
- **½**: Scales the window content to ½ native resolution
- **Native:** Sets the window back to native resolution.
- **2x:** Scales the window content to 2x native resolution
- **4x:** Scales the window content to 2x native resolution
- **Custom:** This gets automatically selected if the window size has been scaled to any other size.

Default: Native.

Aspect Ratio

' Use the **Aspect Ratio** drop down menu to select the aspect ratio of the *Media*MASTER window. The size of the *Media*MASTER window will immediately change when a different aspect ratio is applied.

- **Device:** This specifies the aspect ratio of the detected input signal.
- **4:3:** This specifies a 4:3 aspect ratio
- **5:4:** This specifies a 5:4 aspect ratio
- **16:9:** This specifies a 16:9 aspect ratio
- **Custom:** This gets automatically selected if the window aspect ratio has been adjusted from one of the default settings. This only sets the aspect ratio of the current window back to the chosen aspect ratio.

Default: Device.

Locking Aspect Ratio (checkbox)

Enter a checkmark (U) in the **Maintain Aspect Ratio** checkbox to keep the window at the specified aspect ratio when scaling.

Default: Not Checked

Specifying Window Size

' Use the **Size** text boxes (*width x height*) to specify the exact size of your *Media*MASTER window.

Default: Native size of window content plus borders and menu size.

Locking Window Size

Enter a checkmark (U) in the **Lock Size** checkbox to prevent the window from being resized. Once enabled, you will not be able to resize the window using the mouse. **Style, Preset Size, Aspect Ratio** and **Size** fields are disabled (appear grayed out).

Default: Not Checked

Specifying Window Position

' Use the **Position** text boxes (X and Y co-ordinate) to specify where the window should be on the display wall. The co-ordinates entered will specify where the top left corner of the *Media*MASTER window will be located.

Default: (50,50)

Locking Window Position

Enter a checkmark (U) in the **Lock Position** checkbox to prevent the top-left corner of the window from being moved. Once enabled, you will not be able to move the window using the mouse or enter data into ***X*** and ***Y*** fields. The window can still be resized.

Default: Not Checked

Always on Top

Enter a checkmark (U) in the **Always on Top** checkbox to display the *Media*MASTER window in the foreground when another window is open. When two overlapping windows have this feature selected, the most recently selected window will be in the foreground.

Cropping/Blanking Windows

' You can choose not to display various image data by cropping (or blanking) a certain number of columns or rows from each edge of the input signal. Cropping can be done in two ways. You can select the region of the image you want to display using the

mouse or you can specify the number of columns and rows you don't want to see in the image through the *Window Preferences* dialog box.

Cropping/Blanking using Window Preferences

1) Open *Window Preferences* dialog box.
2) In the **Cropping/Blanking** dialog boxes (Figure 5.9.) specify which section to crop from and how many lines to crop. The *Media*MASTER window will adjust to fit the size of the cropped image.

To undo cropping, click on the **Reset** button at the center of the cropping dialog boxes. This will undo cropping and return the image to normal size.

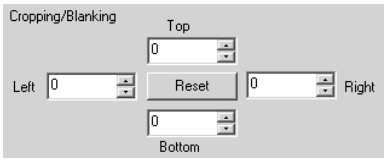


Figure 5.9. Cropping/Blanking dialog boxes

Cropping/Blanking using the mouse

1) Open a *Media*MASTER window.
2) On your keyboard, hold down the **Ctrl** (control) key. The window will come up with a *'crop from (x:123, y:123)'* message indicating that you can now select the area you want to crop.
3) Using your mouse, hold the left mouse button down and select the region of the window you want to keep. A border will be drawn across the region of the window you are selecting. (Figure 5. 10.)
4) Release the mouse button to complete your selection. The window will resize to fit the cropped area when **Lock Window Size** is unchecked.

Figure 5. 10. Cropping using the mouse

To undo cropping, hold down the **Ctrl** (control) key and with the mouse right click on the *Media*MASTER window.

5.5 Content Capture

You can take a "snapshot" of the current image displayed in *MediaMASTER* or a series of images using the *Content Capture* dialog box.

The *Content Capture* dialog box allows you to:

- Select the format and quality of the image capture
- Select the frequency of a capture: single or periodic
- Choose a location on the hard drive to save images

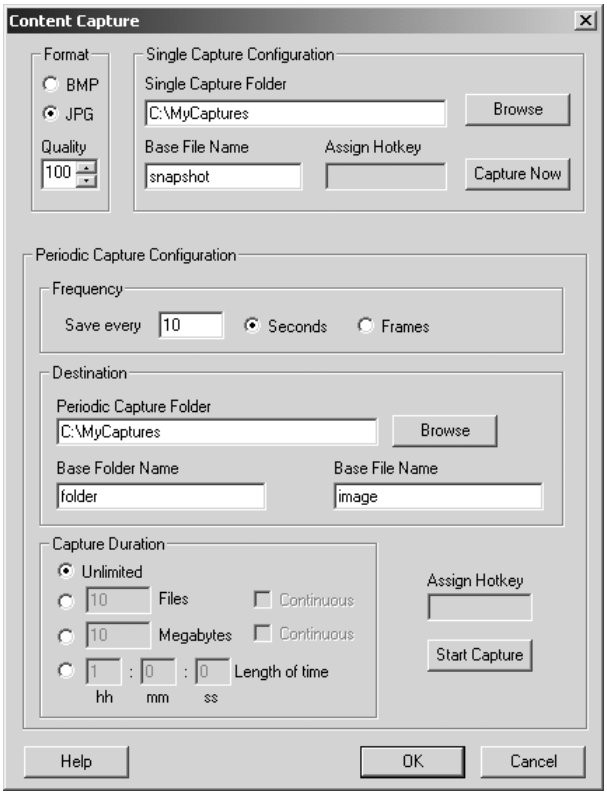


Figure 5.11. Content Capture Dialog Box

Access Content Capture ' Select *Content Capture* from the *Media*MASTER menu bar or the right click menu.

Capture Format ' You can select the format and set the quality you want the captured image to be saved in by selecting JPG or BMP. Only when JPG is selected can you enter a value for quality.

Configuring Single Frame Capture options

In **Single Capture Configuration** you can select the name and location of where the image file(s) will be stored when using the snapshot or single capture feature. (Figure 5.12)

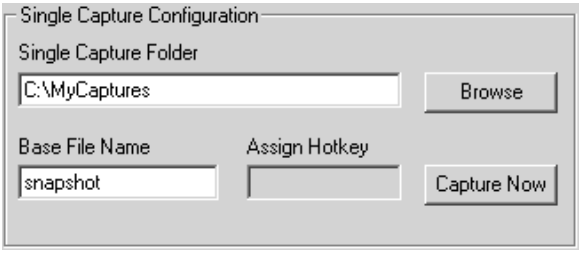


Figure 5.12.

- The text field **Single Capture Folder** specifies the folder where the image will be saved. Use your **Browse** button to navigate your file system to locate a specific folder or enter the location and folder directly into the text entry field.
  The default folder is C:\MyCaptures.

- The text field **Base File Name** specifies the base name the image file will have. You can enter a name into the text field or use the default. Following the base name is a 4-digit sequential number automatically assigned by the system.
  The default base file name for a single capture is Snapshot.

- The text field **Assign Hot Key** allows you to assign a specific key sequence so that you can quickly take a current snapshot of the *MediaMASTER* window. Although the Assign HotKey field appears grayed out you can select it and enter a key sequence.
  NOTES: 1) There is no default hotkey. 2) When you take a snapshot using the hotkey the image is saved using all the current Content Capture settings.

Capturing a Single Frame (Snapshot)

You can take a single frame capture of the current *Media*MASTER window by doing one of the following:

- Right click on the *Media*MASTER window and select **Snapshot.**
- Click on **Capture Now** in the "Single Capture Configuration" section of the *Content Capture* dialog box.
- With the *Media*MASTER window selected, type in the hotkey (assigned in the *Content Capture* dialog box)

Configuring Periodic Capture options

In **Periodic Capture Configuration** you can specify the frequency of image capture, select the name and location of where the captured image files will be saved and set the duration. (Figure 5.13.) This feature allows you to automate the process of image capture.

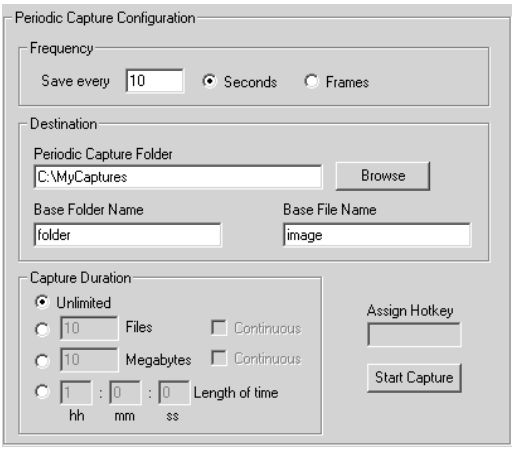


Figure 5.13. Periodic Capture Configuration section of the content Capture dialog box

The options in **Frequency** allow you to specify how often to capture the image (in seconds or in frames). The frequency specified is approximate. The minimum frequency and precision of capture is dependent on system loading.

Default: 1 image every 10 seconds.

The options in **Destination** allow you to specify a folder name and the location where the captured image files will be saved.

- **Periodic Capture Folder:** Specifies the folder where the images will be saved. Use the **Browse** button to navigate your file system to select an existing folder to be used for periodic capture. By default images from a periodic capture will be stored in C:\MyCaptures.

- **Base File Name:** Specifies the base name the image file will have. By default, the base file name for a periodic capture is "*image"* but can be changed to suit. Following the base name is a 4-digit sequential number automatically assigned by the system.

The options in **Capture Duration** allow you to specify how many images the system should save.

- **Unlimited:** When checked, the software will continue capturing frames at the specified frequency until there is no hard drive space available.

- **Files:** Specifies how many files to save before stopping.

- **Megabytes:** Specifies how much space on the hard drive to use for Periodic Capture before stopping.

- **Length of Time:** Specifies how long the system should continue taking snapshots.

- **Continuous:** When checked for **Files**, files will be saved to disk until the specified number of files has been saved. If checked for **Megabytes**, files will be saved to disk until the amount of drive space specified has been used. When a limit is reached, the capture procedure will loop back and begin overwriting the files that were first saved to disk. This way the user will always have access to the most recently captured files.

- The text field **Assign Hot Key** allows you to assign a specific key sequence so that you can quickly initiate periodic capture of the *MediaMASTER* window, saving the captured images using the current Content Capture settings. Although the Assign HotKey field appears grayed out you can select it and enter a key sequence. There is no default hotkey assigned for periodic content capture. More than one hotkey can be assigned.

Start Periodic Capture ' To start periodic capture, click on the **Start Capture** button or use a hot key assigned to this feature, if applicable.

5.6 Quick Access Menu

1) Click on the *Media*MASTER window.
2) Press the **Page Up** or **Page Down** key to bring up the *Quick Access* menu. This allows you to scroll through the various adjustment settings.
3) Press the '↑' or '↓' key to quickly change the following parameters without bringing up the *Input Settings* window:
   - **Video Adjustments**: Channel, Video Standard, Brightness, Contrast, Saturation.
   - **RGB Adjustments**: Channel, Brightness, Contrast, Pixel Tracking, Pixel Phase, Horizontal Offset, Vertical Offset, Clamping Offset

5.7 Changing Language

Select the language you want to use by accessing the **Language** drop down menu from the menu bar or by right clicking the menu. (Figure 5.14.)
Default: English

Figure 5.14. Language drop down menu

5.8 Help Menu

Accessing Online Help

To access online help, select **Help** from the menu bar or using the right click menu select **Contents…** . (Figure 5.15.)

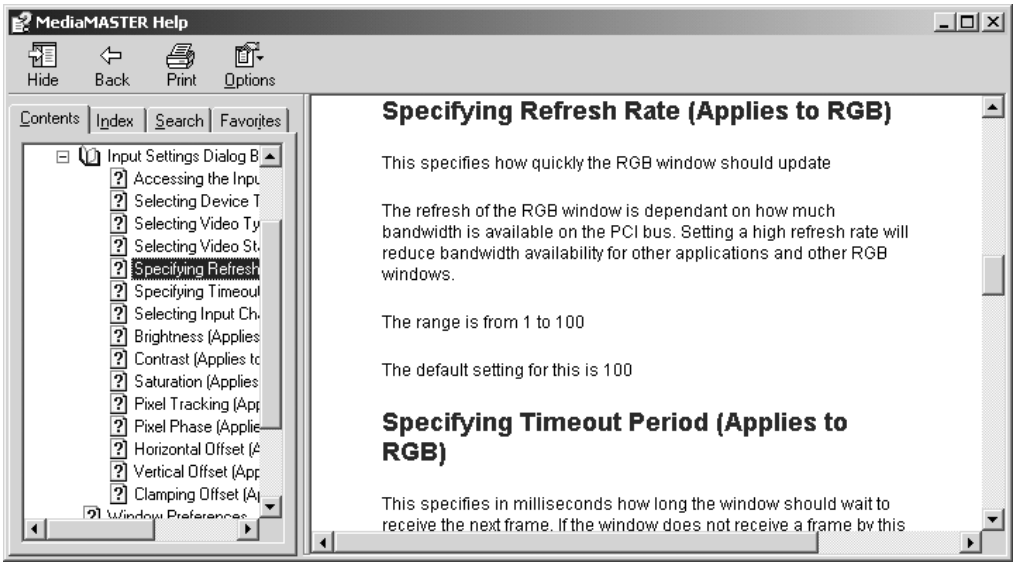


Figure 5.15. Online Help

Identifying MediaMASTER Version

You can identify the version and build number of the installed *Media*MASTER application by selecting **Help** ⇒ **About** from the menu bar. The *About Media*MASTER dialog box will appear. (Figure 5.16.)

Figure 5.16. About MediaMASTER dialog box

Diagnostics box

Access system diagnostic information by selecting **Help ⇒Diagnostics…** from the menu bar. This will bring up the *Diagnostic Information* window (Figure 5.17.)

Figure 5.17. Diagnostic Information dialog box

If you are experiencing difficulties with your FRC controller, save the information in the *Diagnostic Information* window by selecting the **Save to File** button at the bottom of the window, and send this file with a detailed description of the problem to CHRISTIE at controllers@christiedigital.com.

Section 6

*Remote*MASTER™

Overview

*Remote*MASTER is a client server application that allows an operator to control the FRC-5000 keyboard and mouse from a remote PC on the network. The remote PC must be running Windows NT 4.0, Windows 2000 or Windows XP.

6.1 Installation

Before installing *Remote*MASTER you must have an FRC-5000 Controller on an NT network consisting of the following:

FRC-5000 Controller with:

- Windows NT 4.0 and Service Pack 4 (or higher), Windows 2000 or Windows XP
- 1MB disk space

Windows Client PC Workstations with:

- Windows NT 4.0 and Service Pack 4 (or higher), Windows 2000 or Windows XP
- 1MB disk space

Please refer to the Software Installation section in this manual for detailed instructions.

6.2 Using *Remote*Server

Start RemoteServer

Start *Remote*Server by double-clicking on the *Remote*Server icon located on the desktop or by navigating through the start menu: **Start ⇒ Program ⇒ Christie ⇒ RemoteServer**.

When *Remote*Server is running, its icon is visible in the system tray. See Figure 6.1.

Figure 6.1. RemoteServer icon in system tray

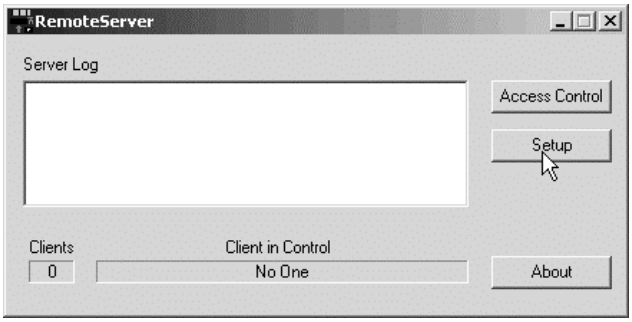


Figure 6.2. RemoteServer dialog window.

Configure RemoteServer

To configure *Remote*Server, do the following:

1) Start *Remote*Server.

2) Click **Setup** (Figure 6.2.) and the *Setup* window will appear (Figure 6.3)

3) Make changes to **ServerPort** and **Default Domain Name** if required. (Figure 6.3.)

Server Port represents the port that *Remote*Server will listen for requests from *Remote*Client. The default port value is 3000. Changing this value is only necessary when another server application is using the same port number. If this is not the case, leave the port number at 3000.

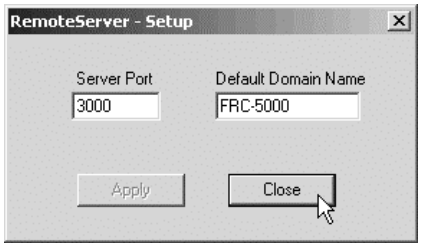


Figure 6.3. Setup Window for Configuring Port and Domain

Default Domain Name represents the domain or system that *Remote*Client user log into when they do not specify a domain name in their login screen. The default value is the name of the system that *Remote*Server is currently running on. Change this value if you want a different default domain name.

If changes have been made, click **Apply** and then click **Close**. If there are no changes, click on **Close** to close the Setup window.

4) After closing the *Setup* window, click **Access Control**, located on the *Remote*Server window. The Access Control window will appear (Figure 6.4.)

5) Click **Add** to add an IP address, Computer Name or Username that will be allowed access to *Remote*Server. To delete an entry from the access list, highlight the entry or multiple entries and click **Delete.**

6) Click **Close** to close the *Access Control* window and return to the *Remote*Server window.

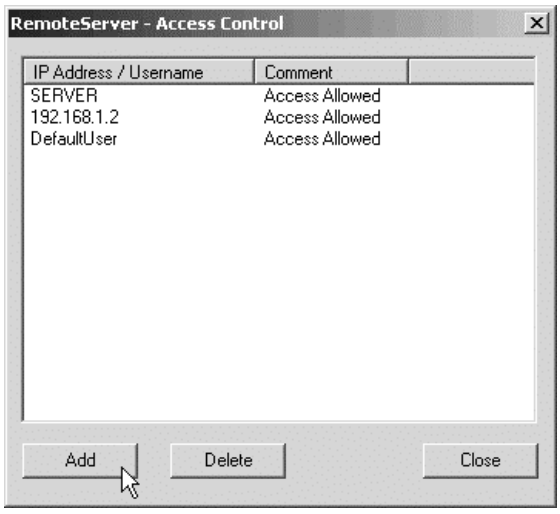


Figure 6.4. Access Control Window

NOTE: In order for any RemoteClient user to access RemoteServer, the IP address, Computer Name or Username must be entered in the list of allows users.

7) *Remote*Server is ready to run. You can now minimize *Remote*Server by pressing the minimize button in the upper right hand corner of the window.

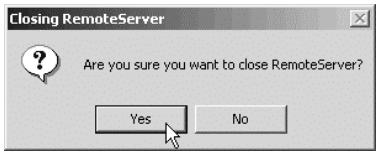


Figure 6.5. Closing RemoteServer prompt

6.3 Using *Remote*Client

Start RemoteClient ' Start *Remote*Client by double-clicking on the *Remote*Client icon located on the desktop or by navigating through the start menu **Start ⇒ Programs ⇒ Christie ⇒ RemoteClient.**

The *Remote*Client window will appear. (Figure 6.6.)

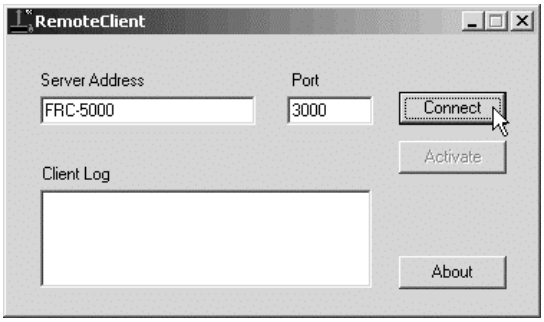


Figure 6.6. RemoteClient window

Configuring RemoteClient

To configure *Remote*Client, do the following:

1) Start *Remote*Client.
2) In the **Server Address** edit box, enter the *IP address* or *Computer Name* of the FRC-5000 controller running *Remote*Server.
3) In the **Port** edit box, enter the port number that *Remote*Server will be running on. The default port number is 3000.

The **Server Address** and **Port** edit boxes are located on the *Remote*Client window. (Figure 6.6.)

Connect to RemoteServer

To connect a *Remote*Client to *Remote*Server do the following:

1) Click the **Connect** button located on the *Remote*Client window. The **User Logon** dialog box will appear. (Figure 6.7.)

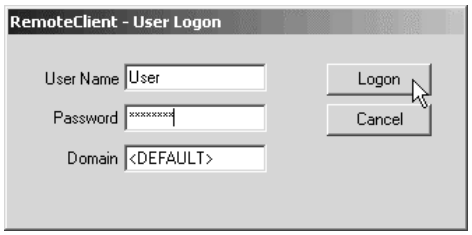


Figure 6.7. User Logon dialog window

2) Enter your username in the **User Name** edit box. Enter your password in the **Password** edit box. Leave the **Domain** set to "<DEFAULT>" or type in "<DEFAULT>" if you want to logon to the *Remote*Server specified default domain. Otherwise enter the appropriate domain name where your username is valid.
3) Click the **Logon** button to begin connecting to *Remote*Server. Click **Cancel** to cancel logon.
   If connection to *Remote*Server was successful you will see it under **Client Log** in the *Remote*Client window.
   If *Remote*Server was not configured to allow your username, IP address or computer name to access *Remote*Server, an error will appear. (Figure 6.8.) Contact your system administrator to resolve this error.

Figure 6.8. Error message indicating access denied from RemoteServer

Taking Control

Once you are ready to take control of the FRC-5000 mouse and keyboard, click the **Activate** button on the *Remote*Client window. (Figure 6.9.)

If you decide to connect to a different server running *Remote*Server, click the **Disconnect** button and reconfigure the server address and port number to that of the new server.

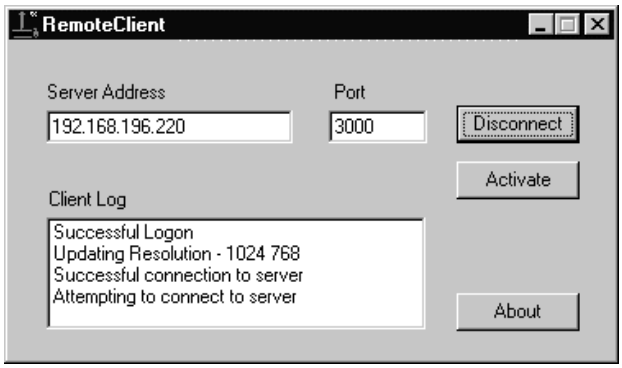


Figure 6.9. RemoteClient dialog window, connected to RemoteServer

Once in control of the FRC-5000 Controller, you will see the *In Control* window. (Figure 6.10.) All of your keyboard and mouse inputs are redirected to the FRC5000-Controller. All keys are functional including system keys (*CTRL, ALT, WINKEY*) except for **CTRL+ALT+DEL**, which still executes on your local machine.

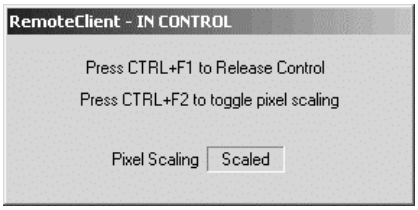


Figure 6.10. IN CONTROL dialog window

CTRL+F1 and **CTRL+F2** are only functional locally and are required by *Remote*Client when *Remote*Client is in control of the FRC-5000 Controller. These key combinations will be explained in detail later.

When Someone Else has Control

There is the possibility that another *Remote*Client user is currently controlling the FRC-5000 Controller. When this is the case, a message box will appear (Figure 6.11) after you have tried taking control.

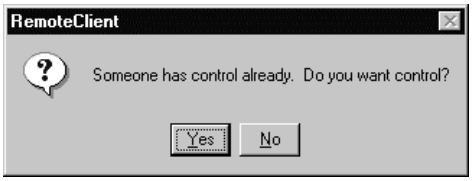


Figure 6.11. Message box prompt to take control

Click **Yes** to force the current controlling *Remote*Client to release control so that you can take control.

Click **No** to leave the current controlling *Remote*Client in control.

Toggling Mouse Pixel Scale

While controlling the keyboard and mouse of the controller you have the option to change the pixel scaling of the mouse movement across the display wall. It is common to have a display wall of 8000 x 6000 pixels being controlled by a *Remote*Client using a 1024 x 768 pixel resolution. When this is the case, it is easier to navigate the mouse cursor across the wall with pixel scaling set to **Scaled.** When it's required that the mouse cursor needs a pixel to pixel resolution for resizing windows, moving windows, clicking buttons, etc., pixel scaling should be set to **Pixel Scaling *1 to 1***. With pixel scaling set **1 to 1**, the mouse cursor will wrap around the screen.

While in control, press **CTRL+F2** to toggle pixel scaling. Pixel scaling toggles from **Scaled** to **1 to 1** as indicated on the *In Control* window (Figure 6.10.)

Releasing Control

' You can release control of the controller by pressing **CTRL+F1**.

You can regain control if you click the **Activate** button again. (Figure 6.9.)

Forced Release Control

' It is possible that while you are in control of the controller, another *Remote*Client user will take control.

When this is the case, a message box will appear (Figure 6.12). Click **OK** to return to the *Remote*Client dialog window.

Figure 6.12. Message box indicating loss of control

Shutting Down RemoteClient

' To shutdown *Remote*Client, click on **[X]** in the upper right hand corner of the R*emote*Client dialog window. It is not necessary to disconnect from the *Remote*Server in order to shutdown *Remote*Client.

6.4 Troubleshooting *Remote*Client

Problem: When attempting to connect to the server, the Client Log indicates "Failed to connect to server" (Figure 6.13.)

Solution:

- Make sure *Remote*Server is running.
- Check that the **Server Address** and **Port** match that of the RemoteServer settings.
- Check that the controller is networked to your client computer running *Remote*Client.

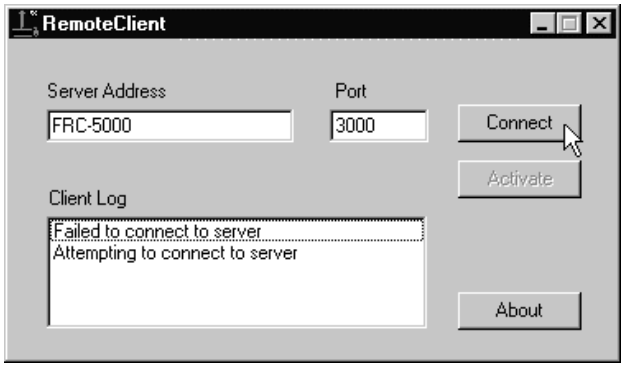


Figure 6.13. Client Log Information

Problem: When attempting to logon to *Remote*Server and the logon fails with a message box error. (Figure 6.14.)

Solution:

- Make sure that *Remote*Server is running on the controller with Administrative privileges with "act as part of the operating system" right enabled.

Figure 6.14. Logon error

Section 7

*Control*MASTER™

Overview

*Control*MASTER software is a "client-server" software package providing powerful and flexible remote management of a multi-display wall from one or more Windows NT/2000 workstations. The software consists of two main components: ***WallServer*** and ***WallManager/WallLaunch***.

WallServer installs on your controller and provides the following display wall services to client computers:

- Monitors and handles all *WallManager* requests from client NT / 2000 workstations.
- Launches applications on the display wall as requested from clients
- Adjusts projector settings via RS-232 communications
- Monitors the network clock for scheduled tasks and events
- Continually updates and displays all wall activity in a 1000-entry log

WallManager installs on all NT/2000 workstations communicating with your controller. These user-friendly components offer flexible management of the display wall from the NT client, and include the following functions:

- Adds, edits or deletes tasks and events for wall display
- Provides local wireframe mock-ups of applications for easy manipulation on client NT / 2000 workstations
- Simulates display for creating preliminary "mock-ups"
- Manages precise scheduling (hourly, monthly, etc.) of applications and projector tasks
- Manages an application's position and size on the wall
- Manages user's rights, wall access & security
- Adjusts basic projector parameters (stand-by, on/off, etc.)
- Adds, edits or deletes scheduled projector tasks
- Offers "hot keys" for quick changes via keystrokes or RS-232 communications
- Grabs a "Snapshot" of configuration data from currently running applications
- Provides a "Panic Mode" for emergency control of the display wall
- Enables use of a backup FRC-5000 controller in the event of a primary FRC-5000 controller failure.

7.1 The "FRCAdmin" account

When installing the *WallServer* component on the controller a dialog box appears asking to create a user account to use with the *Control*MASTER software.

Figure 7.1. Creating FRC-5000 Administrator Account

Specify a **Username** for use with *Control*MASTER. Note this is the account that you must initially log into *Control*MASTER with.

This account has been pre-installed at the factory: **Username: *FRCAdmin*** and **Password: <*no password assigned*>**.

7.2 Pre-installation: Creating / Configuring Users

Adding a ControlMASTER User

Before installing *Control*MASTER software components, use an administrator account to create and configure one or more *user accounts* (users) as described in *Adding a ControlMASTER User*. Users will then be able to access *WallServer* and *WallManager* immediately upon installation.

Use an administrator account to create user accounts on the controller for any existing user that will be using *Control*MASTER software. Note that because *WallServer* uses the local Windows XP login (username and password) for login on the controller, make sure that each *Control*MASTER login is identical to their local XP login.

Each user that will run this software must have an account setup with their username on the controller.

7.3 Getting Started

With ***WallServer*** installed on the FRC-5000 (server) and *WallManager* installed on one or more Windows NT 4.0 (Service pack 4 or higher) / 2000 / XP workstations (clients), you are now ready to configure your *Control*MASTER software for use with a display wall.

IMPORTANT! Keep in mind that *Control*MASTER software components are initially accessible through one account only: the **FRCAdmin** account created before installation. All settings must be configured through this account—***DO NOT DELETE the FRCAdmin account.***

Configuring WallServer

Running WallServer for the first time

1) Using the FRCAdmin account, start *WallServer* by double-clicking the *WallServer* icon on the controller's desktop (or use **Start ⇒ FRC-5000 MASTERSuite ⇒ WallServer** in Windows). This will call up the main *WallServer* window (Figure 7.2).

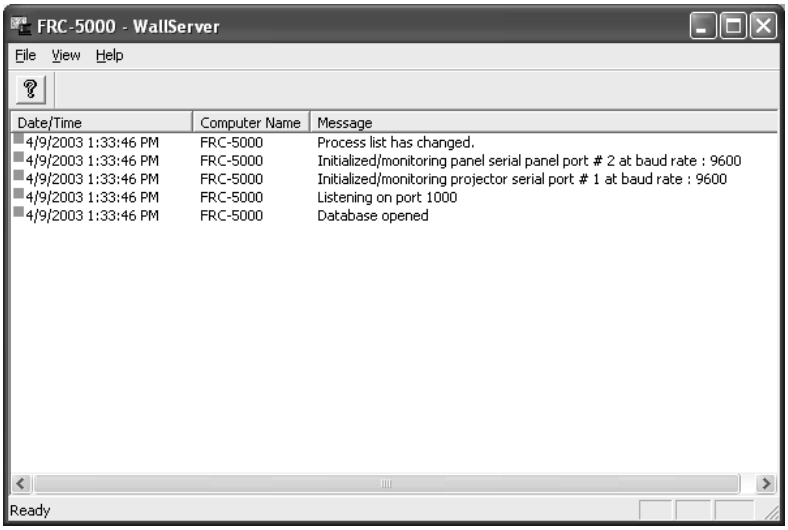


Figure 7.2. WallServer Main Window on Display Wall

2) From the *WallServer* menu, select **View ⇒ Settings**. A *Settings* window appears with server name, ports, baud rate and projector model listed under the **Server Configuration Options** tab. (NOTE: *WallServer* reads the Windows Registry for this information). Also shown is the RS-232 (serial) communication link information, if present.

3) Make modifications in the *Settings* window as necessary and click **OK.** (Figure 7.3.)

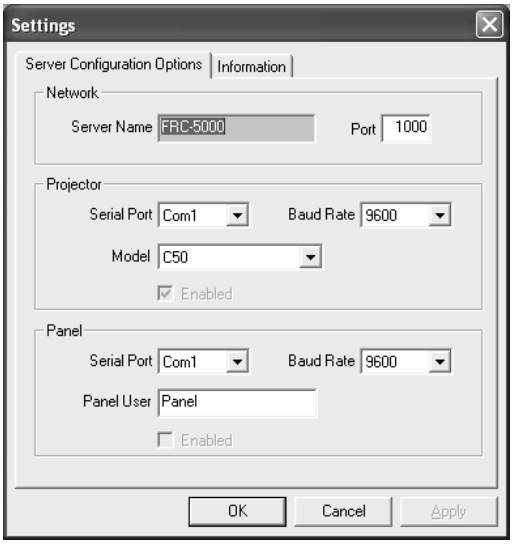


Figure 7.3. WallServer Server Configuration Options window (sample)

From the Settings window you can select the **Information Tab** at the top. When selected it displays a read-only window indicating the number of projectors available in your display wall and what the combined resolution is.

Changing the WallServer Configuration

Many *WallServer* settings are read from the Windows registry, thus they are determined automatically upon startup and require no further adjustment. If, however, if you must change your *WallServer* settings, first make sure to close any *WallManager* sessions that may be running. Any changes in *WallServer* configuration settings will then be recognized in future *WallManager* sessions—i.e., you must close and restart *WallServer*.

Table 7.1. WallServer Server Configuration Options

Setting	Definition
Network Server Name	The server name assigned when NT was setup (check your System properties in Control Panel to find the registered computer name).
Server Port	The "socket" port used for the *WallManager/WallServer* communication. This should be set to 1000.
Projector Serial Port	The FRC-5000 serial port used for RS-232 communications. Projector controls (such as test patterns, brightness etc.) are sent to this port.
Projector Baud Rate	Transfer rate used on the projector serial port.
Projector Model	The projectors used in the display wall.
Projector Enabled	(read only) Status of serial link to projector.
Panel Serial Port	If a compatible RS-232 controller is present, enter which port is connected to the FRC-5000 controller.
Panel Baud Rate	If a compatible RS-232 controller is present, enter the user account required for access to it.
Panel Enabled	(read only) Status of serial link to panel.

Configuring WallManager: Connection Settings

Running WallManager for the first time

Make sure that *WallServer* is running on the FRC-5000 controller (Primary Server). Each workstation (client) must then be configured as described below to ensure proper communication with the server.

NOTE: If WallServer software or the Primary Server is unavailable, WallManager displays a prompt upon startup and checks the Secondary Server. If neither server is available, WallManager can be opened but will not display an active wall window.

From a workstation, use the FRCAdmin account to start *WallManager* by double-clicking the *WallManager* icon on the desktop (or use **Start⇒*FRC-5000 MASTERSuite*⇒WallManager** in Windows). The *WallManager* main window will appear.

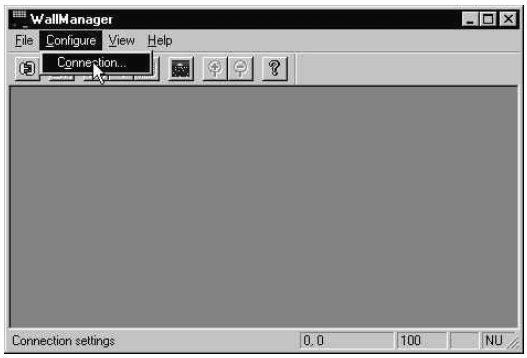


Figure 7.4. WallManager main window when not connected to WallServer

Then, in *WallManager*, establish client/server communications as described below:

1) In the main *WallManager* window, click **Configure ⇒ Connection …**

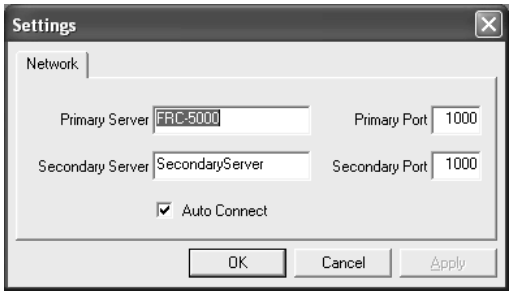


Figure 7. 5. Enter Server Information

2) In the **Primary Server** field, enter the IP address (or hostname, if available) of your FRC-5000 controller.

3) The **Primary Port** field corresponds to the network server port already configured in *WallServer*, and should not require a change.

4) In the **Secondary Server** field, enter the IP address (or hostname, if available) of your backup FRC-5000 controller. If you have no secondary server, leave the field as is.

5) Enter a checkmark (default) in the **Auto Connect** box to automatically connect to the Primary/Secondary Servers each time *WallManager* is launched (recommended).

6) Click **OK** to return to the main *WallManager* window. Note that at this point, *WallManager* is not yet communicating with *WallServer*.

7) In the main *WallManager* window, select **File ⇒Connect…**. Enter the FRCAdmin password and click **OK**.

WallManager is now configured on this workstation and can be run using the FRCAdmin account—you are now ready to add other users.

Changing WallManager Configuration

Change *WallManager* configuration settings only if there is a change to the name or IP address of the controller running *WallServer*.

Creating WallManager Users

You must have "Users" security privileges in order to add *WallManager* users and/or specify their *WallManager* privileges. Initially, only the FRCAdmin account has these privileges—through this account you can add standard *WallManager* users as well as other users for whom you can grant "Users" security privileges.

1) Log on with "Users" security privileges rights (such as FRCAdmin).
2) In the main *WallManager* window, click **Configure ⇒User…** The *User* window will appear.

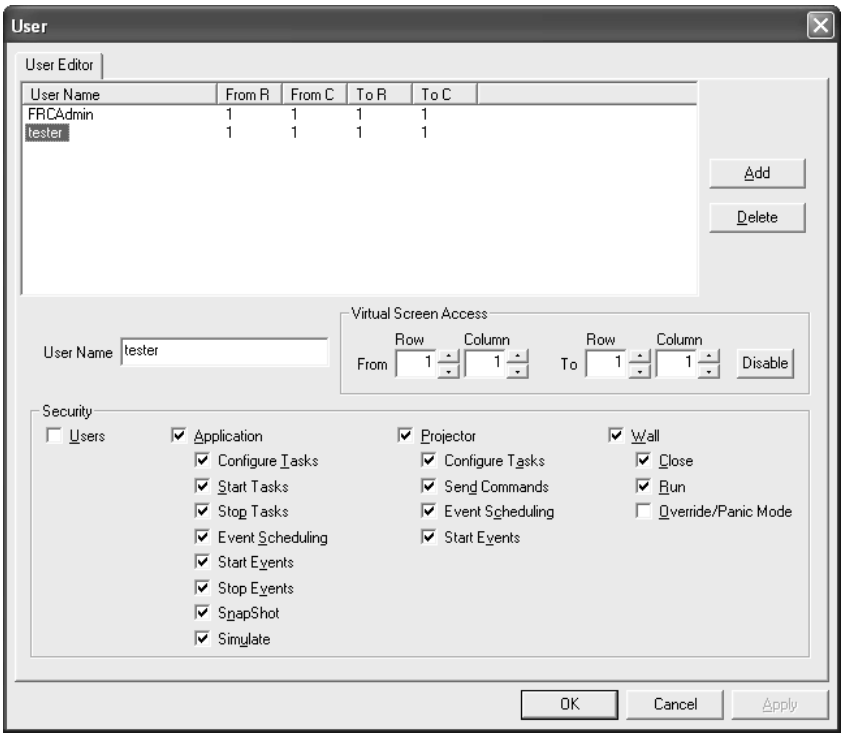


Figure 7. 6. WallManager's User Window

3) From the *User* window, click **Add**. The default user name "New" appears in the white "User Editor" window and the **User Name** box.
4) **USER NAME**: Change the "New" user name as desired. Use an NT username already established in the Domain or Workgroup.
5) **VIRTUAL SCREEN ACCESS**: In the "*Virtual Screen Access"* field, specify what portion of the display wall this user will be managing—or click on **Disable** to prevent this user from working with any screens.
6) **SECURITY**: Specify what rights this user will have when using *WallManager*.
   - **Users**: Enter a checkmark to enable this user to add/delete users or change existing privileges for any user. Initially, only the FRCAdmin account can specify these user privileges—if you want *only* the FRCAdmin account to have the ability to manage users, delete the checkmark for all other users.

- **Application**: Enter a checkmark to enable this user to work with applications on the display wall. Within the **Application** list, you can further refine which specific Application functions this user can utilize—if nothing is specified, the user will only be able to access the *Application* command in *WallManager's Configure* menu. Uncheck the application box to prevent the user from working with applications entirely.
    - Configure Tasks: Create tasks & add to the Task List.
    - Start Tasks: Start tasks from the Task List.
    - Stop Tasks: Stop tasks from the Task List.
    - Event Scheduling: Schedule events made up of tasks from the application Task List.
    - Start Events: start events from the application Event List.
    - Stop Events: Stop events from the application Event List.
    - SnapShot: Create a "snapshot" of the applications on the wall, adding their configurations to the Task List and a numbered "snapshot" event to the Event List.
    - Simulate: Mock-up graphic representations of Task List applications on your monitor without launching them on the wall.

- **Projectors**: Enter a checkmark to enable this user to execute projector functions available through *WallManager*. Within this list, you can further refine which specific Projector functions this user will be able to utilize. Uncheck the projector box to prevent the user from working with projectors entirely.
    - Configure Tasks: Create projector tasks and add them to the Task List.
    - Send Commands: Send projector commands to the projectors.
    - Event Scheduling: Schedule project tasks.
    - Start Events: Start events from the projector Event List.

- **Wall**: Enter a checkmark to enable this user to execute special wall functions available through *WallManager*. Within this list, you can further refine which specific wall functions this user will be able to utilize. Delete the top checkmark to prevent the user from working with these functions entirely.
    - Close: Close an application running on the wall.
    - Run: Use File⇒Run to perform a quick launch of an appliction.
    - Override/Panic Mode: With Override/Panic Mode access, the user can declare a Panic Mode condition and shut down the scheduler. Only Panic Mode users are allowed to start tasks while in Panic Mode – all other users will be in read-only mode.

7) When you have configured this user as desired, click **Apply** to continue creating users (changes are saved in the database). Click **OK** when you are done. To cancel your editing, click **Cancel**. Users can be added or their rights reconfigured at any time by using an account with "Users" security privileges. (See *Editing User Privileges* later in this section)

Mapping of Drives

When launching applications, the location—i.e., program path—of all required application files must be common to both the machine running *WallManager* and the FRC-5000 controller running *WallServer*. This path is required in order to configure

applications for launching, and must be the same as the location used by the FRC-5000 controller for scheduling this application launch.

Set common Program Paths in either of two ways—map common drive letters to shared drives, or use UNC path names.

Example of System Setup

Consider the following system setup, where Drives C and Z are mapped differently between the workstation and the *FRC-5000* controller.

Workstation running WallManager *Computer name:* **WM1**	*FRC-5000 controller running WallServer* *Computer name:* **FRC5KC**
Drive C: Shared as **WMC**	Drive C: Shared as **FRC5KC**
Drive D: Not shared	Drive D: Not shared
Drive X: Mapped as \\FRC5K\Cdrive	Drive X: Mapped as \\FRC5K\Cdrive
Drive Y: Mapped as \\WM1\WMC	Drive Y: Mapped as \\WM1\WMC
Drive Z: Mapped as \\SERVERX\C Drive	Drive Z: Mapped as \\SERVERY\C Drive

Valid cases for configuring applications (done in *WallManager*) and launching them (done in *WallServer*):

- Configure or launch application with Program Path of **\\FRC5K\Cdrive**
- Configure or launch application with Program Path of **\\WM1\WMC**
- Configure or launch application with Program Path of **X:**
- Configure or launch application with Program Path of **Y:**

The following cases are **invalid** and will result in unexpected behavior:

A WallManager configuration of an application's Program Path as C:

Problem:

WallManager will be able to locate the application on the C: drive of WM1, but *WallServer* will be searching for this application on the C: drive of FRC5K. Two things can happen in this situation. If this application does not exist on the C: drive of FRC5K, *WallServer* will be unable to locate this application when scheduling. If this application *does* exist in the same path on FRC5K, the application will be found for scheduling, but it will use any required configuration files, etc. from FRC5K instead of from WM1, as was intended.

Solution:

The proper way to run an application from the C: drive of WM1 would be to set the *Program Path* to either \\WM1\WMC or Y:\.

A WallManager *configuration of an application's* Program Path *as D:*

Problem:

Since WM1's drive D: is not shared, *WallServer* on FRC5K would not be able to run any applications from this drive.

Solution:

In order to run applications from WM1's D: drive, this drive would have to be shared out and the application's *Program Path* would have to be set as specified in the solution to Problem A.

A WallManager *configuration of an application's* Program Path *as Z:*\

Problem:

Since WM1's drive Z: is mapped differently than FRC5K's drive Z:, *WallServer* on FRC5K would be searching for the application on a different server (\\ServerY\C).

Solution:

In order to run applications from \\ServerX\C Drive, either the UNC path name would have to be specified in the application's *Program Path* field, or both WM1 and FRC5K would have to map a common drive letter to this path (e.g. both machines could map W: to \\ServerX\C Drive.

A WallServer *launch of an application on the wall from the C: drive.*

Problem:

WallManager running on WM1 monitors applications that are launched on the wall. If an application is launched from the FRC5K C: drive, *WallManager* will try to manage this application from the C: drive it recognizes on WM1. If this application does not exist in the same path on WM1, the user will not have access to the application in the display wall mimic. If the application does exist in the same location on WM1, the application may be accessible, but unexpected behavior may be experienced. This is similar to Problem A.

Solution:

For *WallManager* management, the correct ways to launch an application residing on the C: drive of FRC5K would be to run this application from X:, or to browse through Network Neighborhood to the shared C: drive on FRC5K.

7.4 Using *WallServer*

This section describes the server component of ControlMASTER software.

WallServer must be running and configured as described in *7.3 Getting Started* in order to monitor and carry out *WallManager* requests. Note that *WallServer* stores all user, task, projector and schedule information in a database on your FRC-5000 controller. Make sure there is adequate space on the controller to accommodate this database growth.

Starting WallServer ' Start *WallServer* by double-clicking the *WallServer* icon on the desktop (or use **Start⇒FRC-5000 MASTERSuite⇒WallServer** in Windows.

The WallServer Log ' When *WallServer* is running, a log of server processes appears (sample shown below).

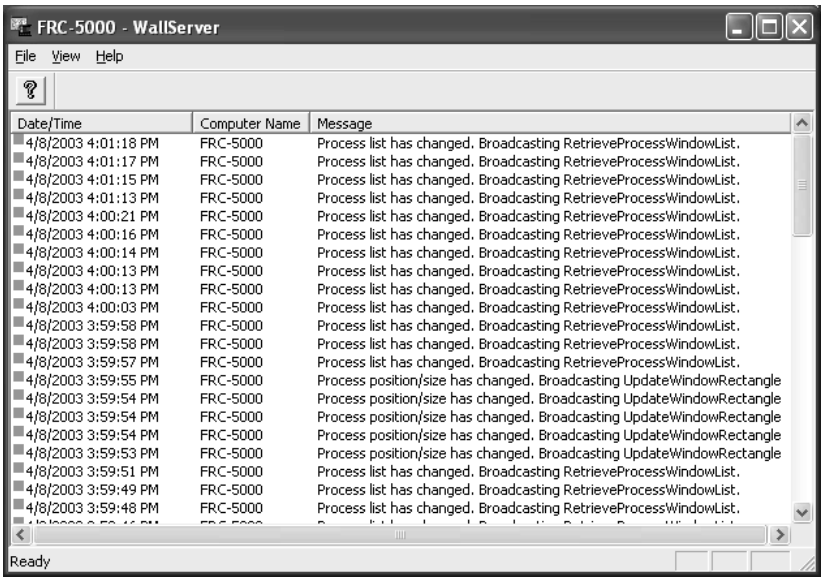


Figure 7. 7. WallServer Database

- This log contains the last 1000 entries, with the most recent processes appearing at the top of the list.
- A green square indicates that the process was completed normally. A yellow or red square indicates that the process did not complete normally and should be checked by the network administrator.
- The log clears itself of all entries whenever *WallServer* is re-launched.

WallServer Toolbar and Status Bar '

Use and/or move the *WallServer* Toolbar and Status Bar as desired.

Shutting down WallServer '

If *WallServer* stops running, a warning message is sent to all active *WallManager* clients. Clients can exit *WallManager* and try to connect to another *WallServer* or wait for the server to start again.

To shut down *WallServer*, click **File⇒Exit** or the ✖ button on the application window title bar.

7.5 Using *WallManager*

Before attempting to use *WallManager*, make sure all *Control*MASTER software components have been installed and configured as described in 7.*2 Pre-Installation* and 7.*3 Getting Started* of this section.

*WallManager*efficiently manages a display wall from one or more NT/2000 XP workstations. This software resides on each workstation and communicates with *WallServer*, which is running on your FRC-5000. Use *WallManager* to manage users and determine their privileges, launch and control applicatioon on the display wall, configure certain basic projector parameters, schedule taks, and perform other related functions.

Starting WallManager '

NOTES: 1) Make sure WallServer is running on your FRC-5000 controller. 2) If launching WallManager for the first time, refer back to Configuring WallManager in 7.3 Getting Started.

Logging On

Users must be configured for using ControlMASTER as described in *7.2 Pre-Installation: Creating/Configuring Users and 7.3 Getting Started (Creating WallManager Users).* Then log on:

1) Log on to a workstation and start *WallManager* by double-clicking the *WallManager* icon on the desktop (or use **Start ⇒ *FRC-5000 MASTERSuite* ⇒ WallManager** in Windows). *WallManager* will establish communications with *WallServer* and ask for your password.

NOTE: If WallServer software or the Primary Server is unavailable, WallManager displays a prompt upon startup and checks the Secondary Server. If neither server is available, WallManager can be opened but will not display an active wall window.

2) Enter your password and click **OK**.

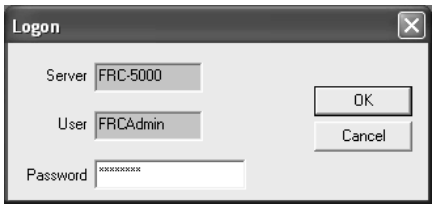


Figure 7. 8. Logon window

3) The main *WallManager* window will appear on your workstation monitor.

Reconnecting to WallServer

If *WallManager* has been disconnected from the server, click **File⇒Connect** to reconnect and continue with normal *WallManager* operation.

The WallManager Main Window

The main *WallManager* window on your workstation monitor provides complete tools for managing *WallServer* applications run on the display wall.

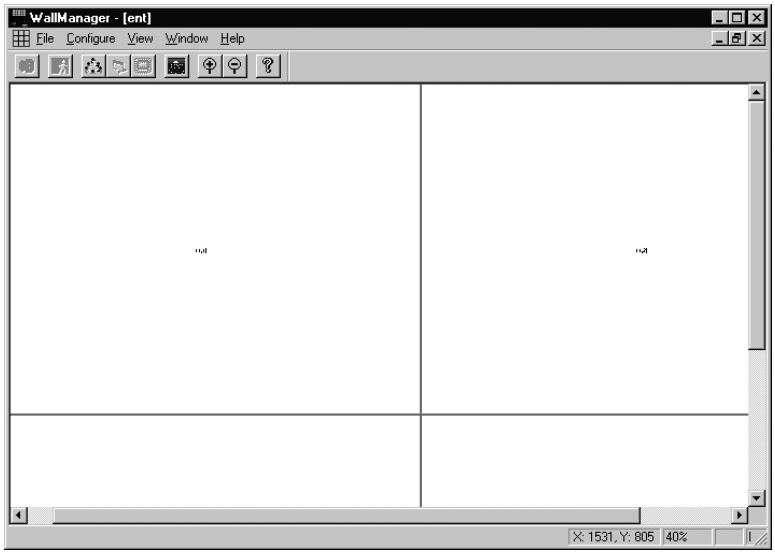


Figure 7.9. WallManager Main Window

In addition to the various menu options on the toolbar, *WallManager*'s main large window provides a wireframe representation or "mimic" of the display wall—i.e., applications running on the display wall will also appear here in a simple wireframe format, where you can select them and conveniently move, resize or close them. The color of the wireframe indicates the current accessibility of the application. See ***Arranging Applications on the Display Wall*** in this section for a complete explanation of wireframes.

WHAT CAN I ACCESS? Note that in ControlMASTER , you might not have access to the entire display wall – in the *WallManager* main window, screens available to you are shown in white and any restricted screens are gray. These access rights-sometimes referred to as your "virtual screen access" – reflect the user configuration specified for you by your system administrator. For example, in Figure 7.10 , User "A" can access only the top left screen of the 4-screen wall whereas User "B" can access all four screens.

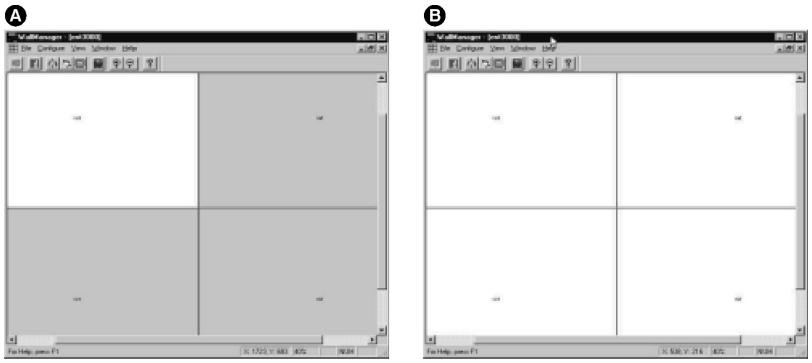


Figure 7.10. White screens are accessible, gray screens are restricted

Regardless of which screens you can access, the total X,Y resolution of the display wall appears at the bottom of the *WallManager* window. X = #pixels across the wall, Y = #pixels from top to bottom of the wall.

Wall addresses (row#,column#) appear in the center of each screen.

CHANGING THE WINDOW: Use the **Window** menu options **Zoom In** or **Zoom Out** as desired (zoom factor of 40%-160% displays on status bar). Or use **Zoom to Sandbox** to create a "best fit" of your working area.

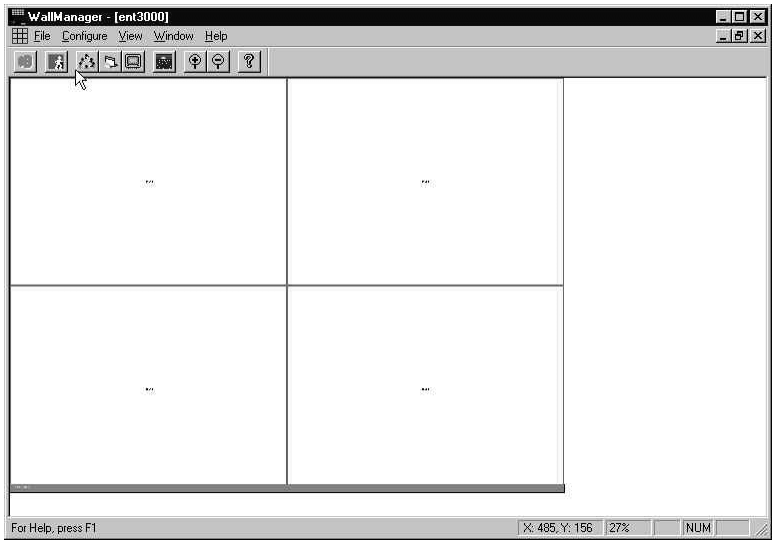


Figure 7.11. "Zoom to Sandbox" for a "best fit" of your working area

WallManager Toolbar and Status Bar

' Use and/or move the *WallManager* Toolbar and Status Bar as desired.

Managing Users

' ***Editing User Privileges***

The FRCAdmin—or any other account with "Users" security privileges—can modify a user's *WallManager* privileges at any time as described below:

1) Log on with "Users" security privileges (such as through FRCAdmin).
2) In the main *WallManager* window, click **Configure ⇒ User…**(requires "Users" security privileges). The User window will appear.
3) In User window, click on the user account you wish to modify.
4) Modify the **Virtual Screen Access** and **Security** options as desired—see Steps 5 and 6 in ***Adding Users*** if you need help.

Changes made to other user accounts will take effect the next time the user starts *WallManager*. Changes to the current account take affect when you click **Apply.**

Deleting Users

The FRCAdmin— or any other account with "Users" security privileges—can delete *WallManager* users as described below. Once deleted, users will no longer be able to use *WallManager*. *NOTE: Users who have jobs scheduled cannot be deleted.*

1) Log on with "Users" security privileges (such as through FRCAdmin).
2) In the main *WallManager* window, click **Configure ⇒User…**(requires "Users" security privileges). The User window will appear.
3) In User window, click on the user account you wish to delete.
4) Click on the **Delete** button, then click **OK.**

7.6. Working with the Display Wall

Building your Application Task List

Users with the necessary Application security rights can develop and maintain a list of tasks to send to the display wall, whether scheduled for a specific time or not. This *Task List* may specify, for example, the regular launching (i.e, display) of an application, such as displaying a particular spreadsheet on the last day of each month. Or you may simply want to define a task so that it will be available for display at any time.

For every application (task) you wish to display on the wall, you must establish 2 main display parameters in *WallManager*. They are:

- what to display
- where to display it

What to display

Determine the source (program name and path) of the desired application. Note that this application must exist on mapped network drives so that *Control*MASTER software can find it. Enter the location in *WallManager*'s **Configure ⇒Application ⇒Task Editor** window.

Where to display

Specify default X,Y display wall coordinates for the upper left corner of the application. You can also specify its size. Enter these values in *WallManager*'s **Configure ⇒Application ⇒ Task Editor** window. If desired, override these defaults for a specific scheduled task in the **Configure ⇒Application ⇒Event Scheduling** window.

When to display

If you want to *schedule* the task for a specific time, you must define when to display it. Specify the frequency and duration of the task (or group of tasks, called an *event*). Enter these values in *WallManager*'s **Configure ⇒ Application ⇒ Event Scheduling** window.

Configuring Applications for Display

To specify an application's source and where you want to display it on the wall, do the following:

1) In the main *WallManager* window, click **Configure ⇒Application…**The Application window will appear—by default, the Task Editor will also be present. (Figure 7.12.)

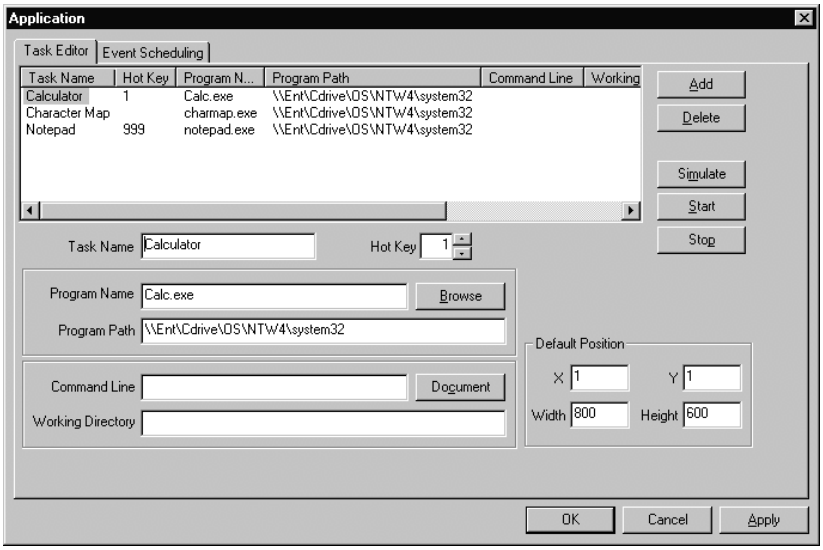


Figure 7.12. Default Application Window: Task Editor

2) In the *Task Editor* window, click on **Add**. A new task called "New" will appear in the task list.

3) Edit the **Task Name** as desired. Then enter its **Program Name** (.exe) and **Program Path**—or use the browse button to find the application in your file system. The **Program Path** specified must be common to both the FRC-5000 controller running *WallServer* and the NT workstation running *WallManager*. This can be accomplished with a UNC path or with a commonly mapped shared network drive.
If an application requires start up files (init, config, images, etc.), specify the location of these files in the "*Working Directory"* field (default is the application's program path).

OPTIONAL: Some applications support the ability to display a specific data file (such as a document or presentation) upon startup. If so, click the **Document** *button to find the file—the necessary* ***Command Line*** *and* ***Working Directory*** *will complete automatically. Enter any switches desired (for example, /s demo.ppt) at the beginning of the* ***Command Line.***

4) Set the default X, Y display wall coordinates desired for positioning the upper left corner of the application on the wall. Also set the desired width and height. Location and size must lie within your screen access boundaries (defined in "Users" rights).

5) If you want to save and then configure another application click **Apply**. Otherwise click **OK** to save your editing or **Cancel** to start over.

So far, the application (task) is not scheduled. You can launch it at any time by selecting the application in the Task Editor window and clicking the **Start** button. The application will appear on the display wall at the position and size specified, as well as in a wireframe representation in your *WallManager* window. To stop the task, select it in the *Task Editor* window and click the **Stop** button.

NOTE: The Program Path of any configured application task must be common to both the WallManager machine and the FRC-5000 controller running WallServer. For details, see Mapping of Drives in 7.3 Getting Started.

Scheduling Applications for Display

Once an *Application Task* has been configured (see *Configuring Applications for Display*, above), you can add it to an *event* and schedule it for launching on the display wall. A broad range of run frequencies are available, including hourly, daily, monthly and weekly. *WallServer* checks for scheduled events upon startup and every few seconds thereafter, performing any required actions immediately.

1) In the main *WallManager* window, click **Configure ⇒ Application…**The Application window will appear.
2) Click on the **Event Scheduling** tab.
3) Click **Add Event—**a "New" event name will appear in the Event List window.

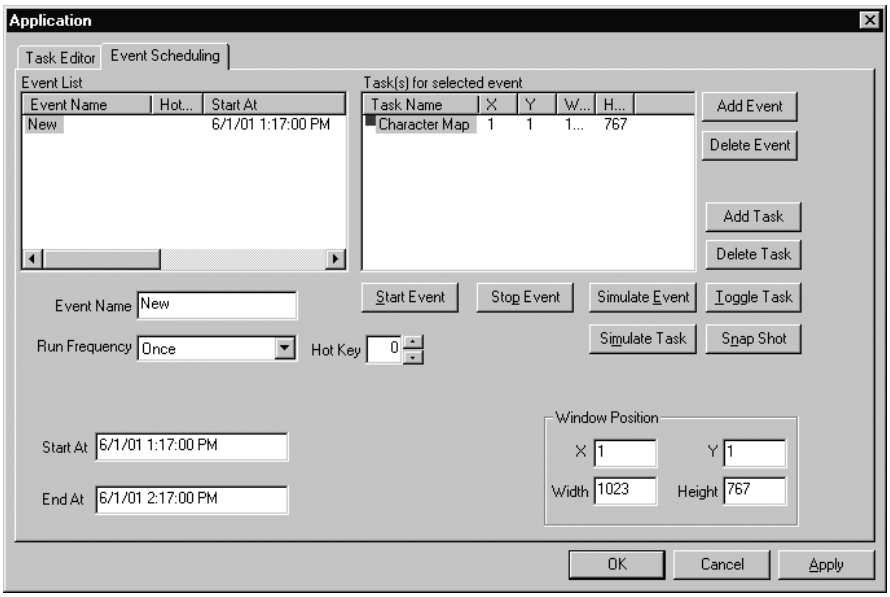


Figure 7.13. Application Window: Event Scheduling

4) Click **Add Task.** Your list of configured tasks will appear in a dialog box (Figure 7.13.). Select any task that you want to include in this new scheduled event. Although the event can consist of one or more tasks, each task must be added individually to the right-hand box called Task(s) for Selected Event.

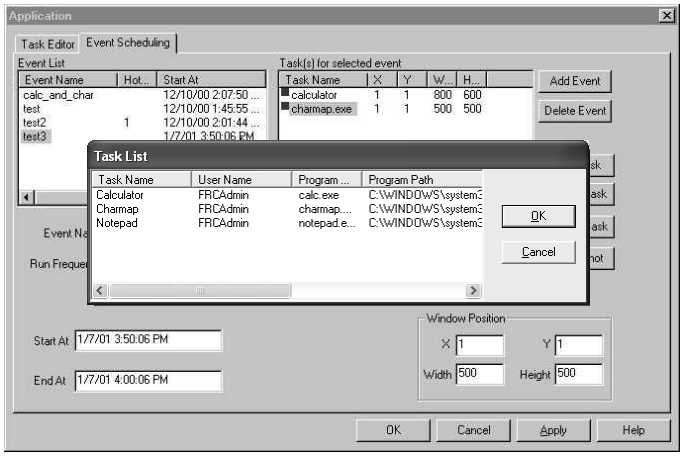


Figure 7.14. Select a task from the Task List dialog box and click OK.

5) With a task selected, you can edit **Window Position** values in order to resize and reposition the task *for use in this event.* Note that these changes will not alter the task's default size and position as specified in the Task List.

6) Edit the **Event Name** as desired.

7) ***SCHEDULE THE EVENT:***

- Select the **Run Frequency** desired (hourly, daily, weekly, monthly, etc.). The tasks included in this event will occur at the specified time interval. Note that one of the options is "non-scheduled". Use this if you do not need to display the event at a particular time.

- Edit the **End At** and **Start At** text boxes to define a valid time slot for running the event. This information is required for all regularly scheduled events, but not for "non-scheduled" events.

- If present, edit the ...**day of every month/week**. Enter a checkmark for each day of the month or week you want the event to occur. For example: You can schedule an event for launch on the on the 1st, 2nd, 3rd, 24th, and 25th of every month, starting at 10:50am and ending at 4:30pm.

  See also, *Hints for Editing Text Boxes* (next page).

8) Click **Apply** to save your scheduling and add another task to the current event or to schedule another event. Otherwise, click **OK** to save and leave this window, or click **Cancel** to start over.

Colored boxes in the *Task(s) for Selected Events* list (**Application…Event Scheduling)** indicate the current status of each task:

- **GREEN**: This task is currently running.
- **YELLOW**: This scheduled task has been terminated (closed) until its next scheduled startup.
- **RED**: This task is not currently running.

The **Events Scheduling** window for applications lists *all* events on the left—including those that launch projector tasks—but lists only *application tasks* on the right.

NOTE: In rare instances you may want certain projector parameters, such as a change in projector status or wall brightness, to accompany an event. See Working With Projectors later in this section.

Hints for Editing Text Boxes

- Unless an application's Run Frequency is "Always scheduled" or "Not scheduled", you must supply **End At** and **End At** dates/times. The **End At** time must be later than the **End At** time. Enter **End At** first.

- If desired, double-click the **End At** and **Start At** text boxes to more easily edit hour:minutes:seconds.

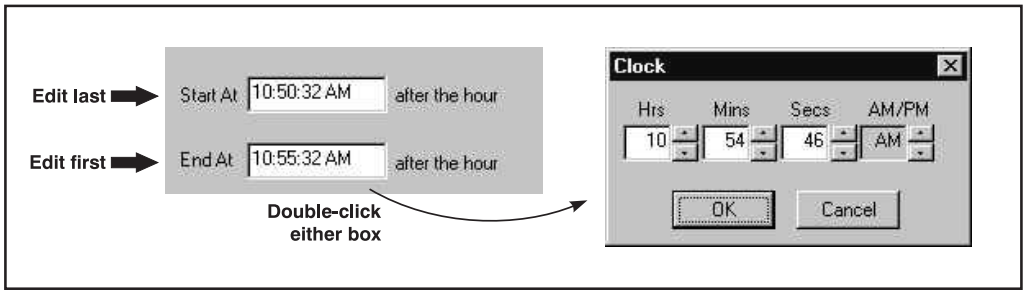


Figure 7.15. Entering a new time (shown is Hourly option)

- ***For an "Hourly" event:*** In the **Start At** and **End At** editing boxes, include the first hour for running the event (default is current hour). Subsequent hourly launchings will ignore this "hour" data and read only the rest of the setting (minutes:seconds) for running the event in the requested time slot. For best results, enter **End At** text first.

- ***For a "Weekly" or "Monthly" event***, also enter a checkmark for the days on which the event is to occur.

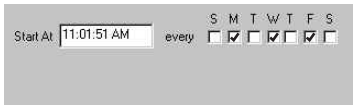


Figure 8. 1. Enter weekly information

Editing a Task or Event

You can edit properties for a previously defined task or event at any time. Highlight the task or event and edit as desired. When done, click **Apply**, then **OK**.

Stopping a Task or Event

You can stop a non-scheduled task/event under the following conditions:

- The task/event is not scheduled to be running at the current time.
- The task/event must have been manually started with the **Start** button.

Highlight the task or event and click **Stop** (or **Stop Event** in the **Event Scheduling** window), then **OK.** Because *scheduled* tasks (events) cannot be stopped with the **Stop Event** button, it ensures no interference with the display schedule. **See *Toggling Tasks On/Off***, below.

Deleting a Task or Event

You can delete a previously defined task or event from your Task List at any time. Highlight the task or event in the Task List and click the **Delete** button. When done, click **OK**.

*NOTE: If you want to only **temporarily** prevent a scheduled event from running, change its Run Frequency to "Not Scheduled" rather than deleting the event entirely. You won't lose the task configuration this way.*

Arranging Applications on the Display Wall

Applications appearing on the display wall also appear in wireframe representations in *WallManager*'s main window. Use wireframes to conveniently resize, move or close an application.

Working with Wireframes

In *WallManager*'s main window, the wireframe titlebar color indicates whether or not you can access this application and whether or not you have selected it.

- Accessible applications:
  - ✓ gray = not selected
  - ✓ blue = selected
- Inaccessible applications:
  - ✓ black = not selected
  - ✓ brown = tried to be selected
- Simulated applications (i.e., not on the display wall):
  - ✓ *dull green = not selected*
  - ✓ *bright green = selected*

Selecting an Application

Right click with the mouse anywhere within the wireframe representation—the cursor will change to a four-headed arrow and the selected application will change color. If you can't select the application, it is likely outside your virtual screen access area.

Moving an Application

Select the application as described above, then use the left mouse button to drag to a new location. This re-location is temporary—upon re-launch, the application returns to the location specified in your Task List.

Resizing an Application

Select the application as described above, then use the left mouse button to drag the borders of the application. This resizing is temporary—upon re-launch, the application returns to the size specified in your Task List. When resizing, certain applications will crop at some point.

Maximizing an Application

To maximize an application so that it fills your entire allotted display area, select the application as described above. Right click again and select **Fit** from the drop-down menu. *NOTE: You cannot minimize or cancel once you have maximized.*

Closing an Application

Select the application as described above. Right click again and select **Close** from the drop-down menu. Or, if it is a scheduled task, use the **Toggle Task** button in the **Events Scheduling** window. The task will remain closed until its next scheduled launch.

Taking a Snapshot of Current Applications

The **Snapshot** button captures applications currently running on the display wall and adds these tasks to your Task List, each automatically configured with its proper program name, program path, and current position and size. The tasks are also added to a single new numbered "snapshot" event in your Event List, providing a quick and reliable way to add properly configured events to your Event List. Note that **Snapshot** will capture only those applications residing in directories accessible with your NT security privileges, and which are positioned completely within the boundaries specified for you by your *WallManager* administrator.

To take a snapshot of the display wall, do the following:

1) Click **Configure ⇒Application...**
2) Click the **Event Scheduling** tab.
3) Click the **Snapshot** button.
4) If desired, set new *Schedule Name, Run Frequency* and time parameters for this new scheduled event.
5) Click **OK** to close the dialog box.

Simulating a Task or Event

Sometimes you may prefer to quickly mock-up (simulate) one or more application tasks or events within your *WallManager* "virtual screen" without actually launching them on the display wall. This simulation enables you to use *WallManager* wireframes to graphically experiment with the size and layout of applications while keeping the current display wall intact.

1) Highlight the desired task or event in your **Task Editor** or **Events Scheduling** window.
2) Select the **Simulate Task** or **Simulate Event** button.
3) Repeat for any additional tasks or events you wish to simulate, then click OK to close the dialog box. Your *WallManager* "virtual screen" will appear with the wireframe applications as they are currently configured for the display wall, but the display wall itself won't change.

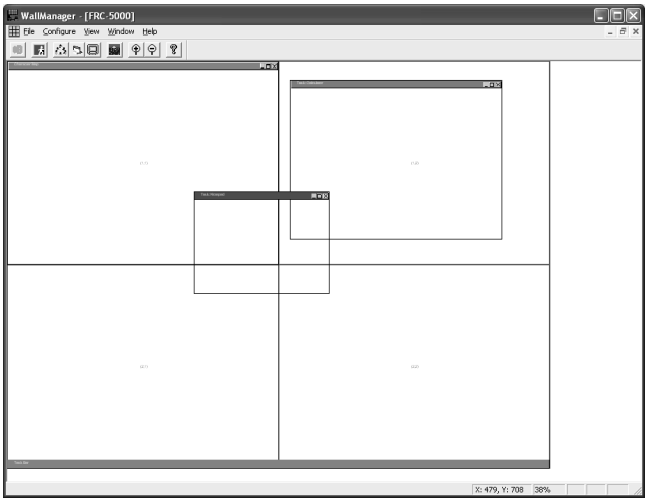


Figure 7.16. Simulating the Wall Layout in WallManager

4) Work with simulated wireframes as desired for improved size, location, etc – note their titlebars are bright green when selected and dark green when not selected.
5) Click the wireframe's close button. If you are satisfied with your changes, save them. If not, don't save them-the originally configured size and position settings for each application will be retained.

To delete a simulated event or task from your "virtual screen":

To prevent simulations from appearing in *WallManager*, toggle **the Simulated Applications** off in the *WallManager* **View** menu.

Toggling Tasks On/Off

Note: For scheduled tasks running at the current time.

Use the **Toggle Task** button in the **Event Scheduling** window to stop or re-start a task that is scheduled to be running at the current time. When stopped, the task will remain closed until its next scheduled launch. Stopping a scheduled task with **Toggle Task** is identical to closing its wireframe in *WallManager*'s mimic window.

Hot Keys

To define a "hot key" shortcut for the highlighted task or event, enter a value from 1-999 in the Hot Key field. See ***Hot Key Shortcuts for Quick Displays*** later in this section**.**

Determining Hot Keys for Application Tasks or Events

If desired, you can investigate the properties of an application. Such information can be helpful when troubleshooting.

1) **SELECT IT**: Right click with the mouse anywhere within *WallManager*'s wireframe representation of the application (if you can't select it, the application lies outside of your accessible area of the wall).

2) **DISPLAY PROPERTIES**: Right click again and select **Properties** from the drop-down menu. This will display the **Properties** window (Figure 7.17)

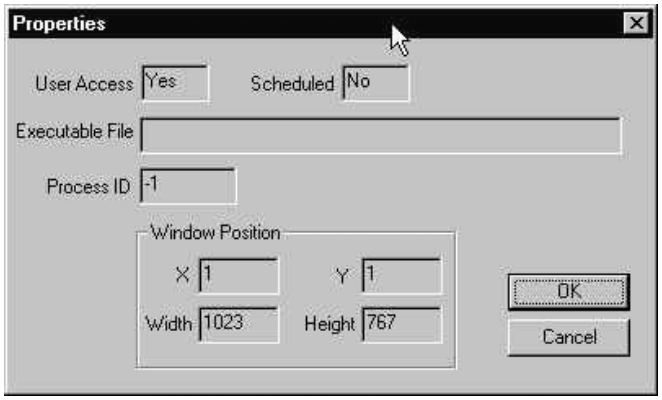


Figure 7.17. Properties for an application

This read-only menu indicates if you have access to this application, and whether or not the application is a scheduled event. The path and filename of the application as well as its monitored process I.D. also appears, along with its current size/location. If there is no "Executable File" entry, the application is merely being simulated in *WallManager*.

Closing an Application on the Display Wall

When an accessible application on the display wall is no longer needed, you can close it from within *WallManager* (in the User menu, you must have been granted the "Close" security under the "Wall" heading):

1) Right click with the mouse anywhere within the wireframe representation of the application.

2) Select Close from the drop-down menu, or click the ✖ button in the wireframe's top right corner.

*NOTE: A warning box appears if the application is part of a scheduled event (*Figure 7.18*). Continue as desired.*

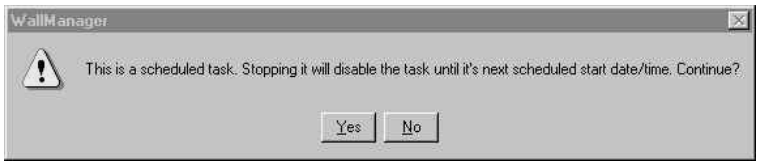


Figure 7.18. Click Yes to close a scheduled task, No to keep it running

Tasks scheduled to be running at the current time cannot be deleted from the *Task Editor*. Likewise, you can't use the controller's keyboard and/or mouse to permanently remove a scheduled task from the wall (it reappears after 5 seconds). Instead, you can move up the task's scheduled **End at** time to the present.

Displaying Non-configured Applications

NOTE: This feature is intended for a single display of an application, such as for a quick one-time test or trial. Frequently run applications should be configured on a task list and scheduled. See ***Building Your Application Task List: Introduction****.*

To run a non-configured application on the display wall:

1) In the main *WallManager* window, click **File⇒Run**.
2) Select the desired file and click **Open**.

Any application started in this manner will be centered using ¼ of your allotted display area – once launched, you can reposition and/or resize as desired (see Arranging Applications on the Display Wall).

7.7 Working with Projectors

NOTE: WallManager users rarely work with projector tasks. The information provided here is recommended for administrators only.

Overview

In your display, images are generated by multiple Christie projectors arranged in rows and columns to form a rectangular wall. Although all projectors offer comprehensive image adjustments through their own internal software, certain basic projector functions can also be controlled in *WallManager* if desired. These are: powering on and off, using standby mode, adjusting brightness and contrast, and (if available) displaying internal test patterns.

Wall Addresses and Projector Ids

Every projector in your wall has a *WallManager* address describing its specific "row, column" screen location. These addresses begin with the upper left corner screen

(1,1), and continue across the top row: 1,2 then 1,3 then 1,4 etc. Addresses in the second row continue in the same manner, beginning at the left screen (2,1). See Figure 7.19.

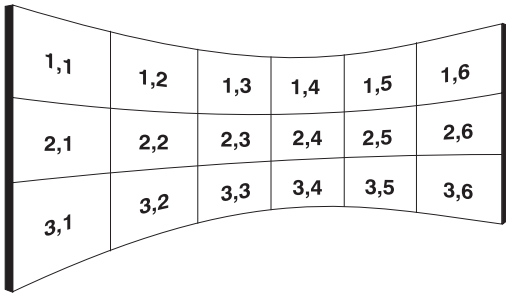
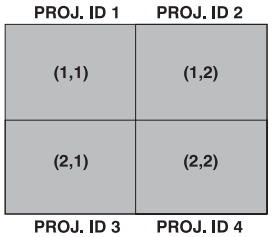


Figure 7.19. Sample wall addresses

You will need to know addresses in your wall when you want to work with an individual projector in *WallManager*.

WallManager addresses map in the same order as projector IDs. For example, in a 2x2 wall:



*Screen Address **1,1** maps to Projector **ID 1***
*Screen Address **1,2** maps to Projector **ID 2***
*Screen Address **2,1** maps to Projector **ID 3***
*Screen Address **2,2** maps to Projector **ID 4***

Initializing Projectors

Projectors must be initialized in *WallManager* if you intend to carry out projector tasks or events on the wall. Initializing establishes the number and type of projectors present, enabling *WallManager* to properly communicate with each projector and is necessary under the following conditions:

- After initial setup of your wall
- If you install a different model of projector
- If one or more new projectors are added

Note, however, that this initialization is necessary only if you intend to carry out *projector* tasks or events – it is not necessary for any other *WallManager* functions such as configuring and scheduling applications.

How to initialize your projectors:

1) In *WallManager*'s main window, click **Configure⇒Projector**.
2) Click on the **Initialize Projectors** tab.

3) All current known projectors (if any) will appear in the window according to "row, column" wall addresses (ignore all values at this point, since you will be re-establishing them). Click on the **Reset All** button,
4) Wait until all values stabilize, then click **OK** or **Apply**. Or click **Cancel** if you do not want to initialize.

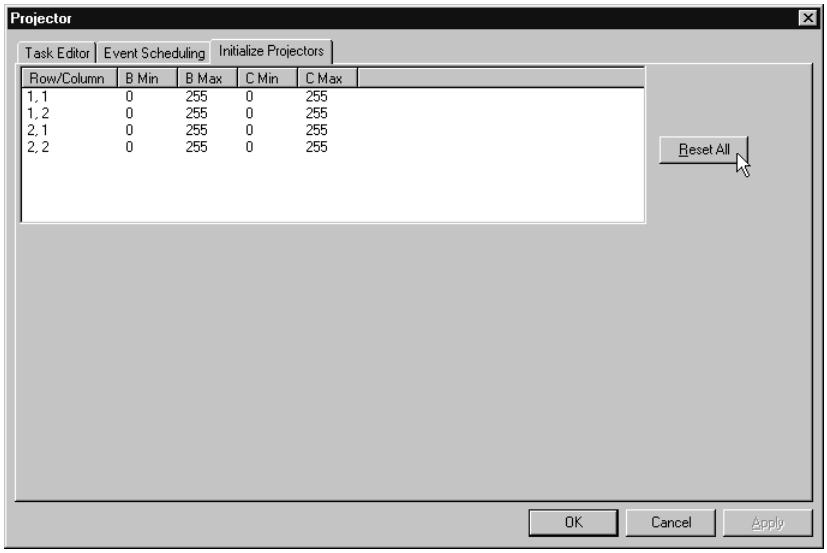


Figure 7.20. Initialize Projectors

Building your Projector Task List: Introduction

As with applications, *WallManager* enables each user to develop and maintain a list of Projector tasks. This Task List may stipulate, for example, the regular power-up of a certain projector, or the display of test patterns across a single row. Or you may simply want to create a frequently used projector task so that it will be available and ready for you to run at any time.

One or more projector tasks can be scheduled together as an event. Or they can be included with an event made up of application tasks, enabling customized projector settings to accompany the launched application(s).

For every projector task you wish to execute, you must establish the name of the tasks, which projector functions are to change (brightness, contrast, power on/off, standby and/or test patterns), and for which projector the changes are to be applied.

If desired, you can then add the configured projector task (or tasks) to a new or existing scheduled event.

Configuring Projector Task for Display

1) In *WallManager*'s main window, click **Configure ⇒Projector**. The **Task Editor** window should appear.

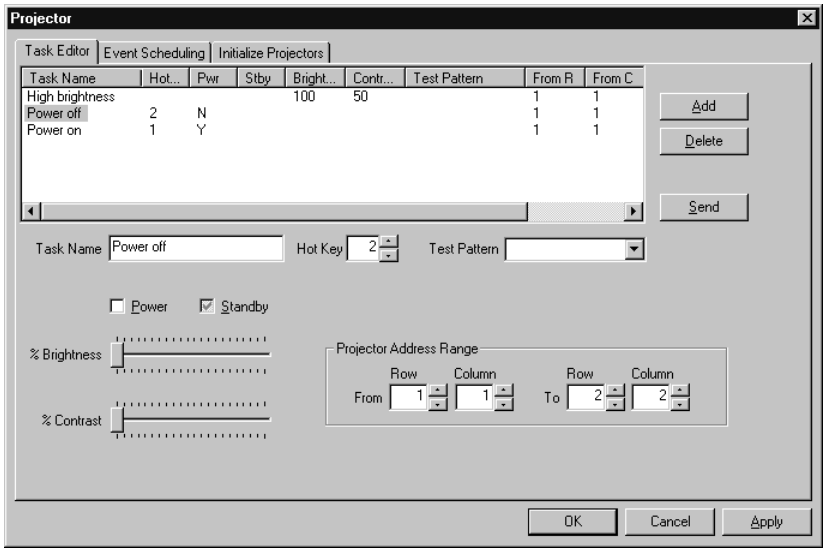


Figure 7.21. Task Editor for Projectors

2) Click **Add**. A new task called "New" will appear—enter a unique name in the Task Name box at any time.

3) Choose from the following options and adjust or clear as desired for this task:

- **Power** (turns the selected projectors on/off)
- **Standby** (puts the selected projectors in standby mode)
- **Brightness** (sets Brightness to a specific level [%] in the selected projectors. If you don't want to change Brightness, keep the slidebar control all the way to the left.)
- **Contrast** (sets Contrast to a specific level [%] in the selected projectors. If you don't want to change Contrast, keep the slidebar control all the way to the left.)
- **Test Patterns** (displays a *DLV1280* test pattern at the selected projector address. Set to "off" if you don't want to send any test pattern.)
- **Projector Address Range** (row, column settings determine on which projectors the task will occur)

NOTE: Gray checkmarks do nothing—each checkbox should either be cleared or have a black checkmark.

4) If you want to define additional tasks click **Apply**, otherwise click **OK**. The new task will be saved. Or, to start the task on the designated projector(s), click **Send**— the settings will remain in effect on the wall until they are changed via another **Send** command. Click **Cancel** if you don't want to save your task settings.

*NOTE: Projector tasks won't appear on the wall unless you click the **Send** button. Do this at any time from within the Projector Task Editor.*

Scheduling Projector Tasks or Events

Once you have defined one or more specific projector tasks, you can specify exactly when the task is to occur:

1) In *WallManager*'s main window, click **Configure ⇒Projector**.

2) Click the **Event Scheduling** tab.

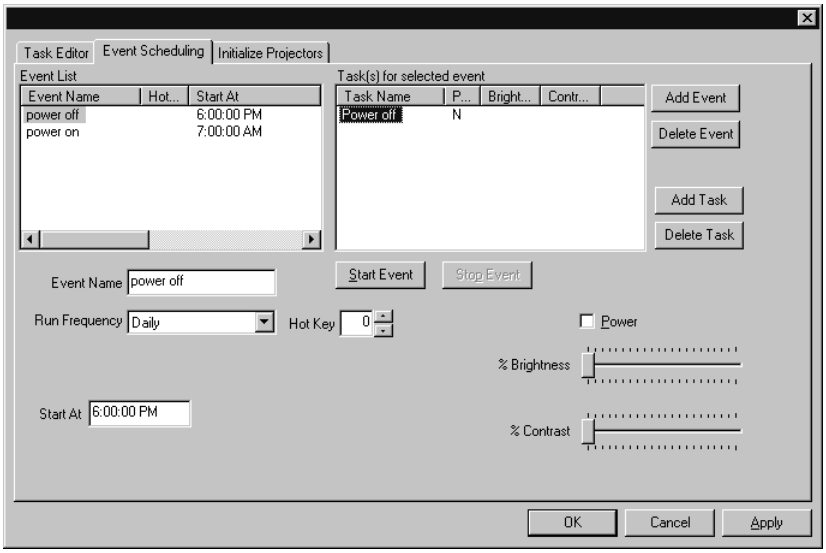


Figure 7.22. Event Scheduling for Projectors

3) Click the **Add Event** button. A new event called "New" will appear in the Event List window—enter a unique name in the Event Name box at any time.
4) Click the **Add Task** button. A list of your configured tasks will appear in the *Tasks(s) for Selected Event* list (note: it shows only the tasks that *you* have configured).
5) In the *Tasks(s) for Selected Event* list, select which task you want to include in this event.
6) Set the brightness and/or contrast level desired. A change here affects the task **only** when run as part of this scheduled event—it does not affect the *Task Editor* configuration. *NOTE: If you don't want to change brightness or contrast, keep both slidebar controls all the way to the left.*
7) Make sure the Power checkbox is **checked** if you want the projectors **on** for this task. Note that a change affects this task **only** when run as part of this scheduled event—it does not affect the *Task Editor* configuration.
8) Set **Run Frequency** and **Start At**—choose the desired frequency, days and times for starting the projector event. See *Scheduling Applications for Display* if you need help entering this scheduling information.

NOTE: "Once" does not function with projector events.

If you want to add more tasks to the event, or if you want to schedule additional events, click **Apply**, otherwise click **OK.** The new event(s) will be saved. Click **Cancel** if you don't want to save your scheduled event(s).

The **Event Scheduling** window for projectors lists *all* events on the left—including those that launch applications—but lists only *projector tasks* on the right.

Assigning Hot Keys for Projector Tasks or Events

To define a "hot key" shortcut for the highlighted task or event, enter a value from 1-999 in the Hot Key field. See *Hot Key Shortcuts for Quick Displays*, below.

Editing a Projector Task or Event

You can edit properties for a previously defined projector task or event at any time. In your *Task Editor* or *Event Scheduling* window, highlight the task or event and edit as desired. When done, click **Apply**, then **OK**.

Deleting a Projector Task or Event

You can delete a previously defined projector task or event at any time. In your *Task List* or *Event List*, highlight the task or event in the *Task List* and click the **Delete Task** or **Delete Event** button. When done, click **OK**.

*NOTE: If you want to only **temporarily** prevent a scheduled event from running, change its Run Frequency to "Not Scheduled" rather than deleting the event entirely. You won't lose the task configuration this way.*

Hot Key Shortcuts For Quick Displays

Assigning Hot Keys

A *Hot Key* is an optional keystroke sequence that you can assign in *WallManager* for starting or stopping a configured task or event. You can then quickly start or stop the task or event in the future by using a 3-5 character keystroke from a variety of locations within *Control*MASTER software. You can create up to 999 *task* hot keys and 999 *event* hot keys.

1) In either the *Task Editor* or *Event Scheduling* (application or projector), highlight the desired task or event and enter a valid number from 1-999 in the Hot Key field. If the number has already been assigned, a message box appears requesting a valid (unused) number.
2) Click **OK** when done. The number, along with a "**T**" (if task) or "**E**" (if event) preceding it has now been defined as a hot key.

Note that hotkeys defined for *tasks* will automatically include "**T**" (or "**t**") and hotkeys for *events* will automatically include "**E**" (or "**e**"). For example in Figure 7. 23., the user is creating a "**T1**" (or "**t1**") hot key—when actually used, the user will preface it with either "**L**" (launch) or "**K**" (kill), as desired. To use the hot key shown below to *start* this task, the user would enter the keystroke **LT1**. To *stop* this task, the user would enter the keystroke **KT1**.

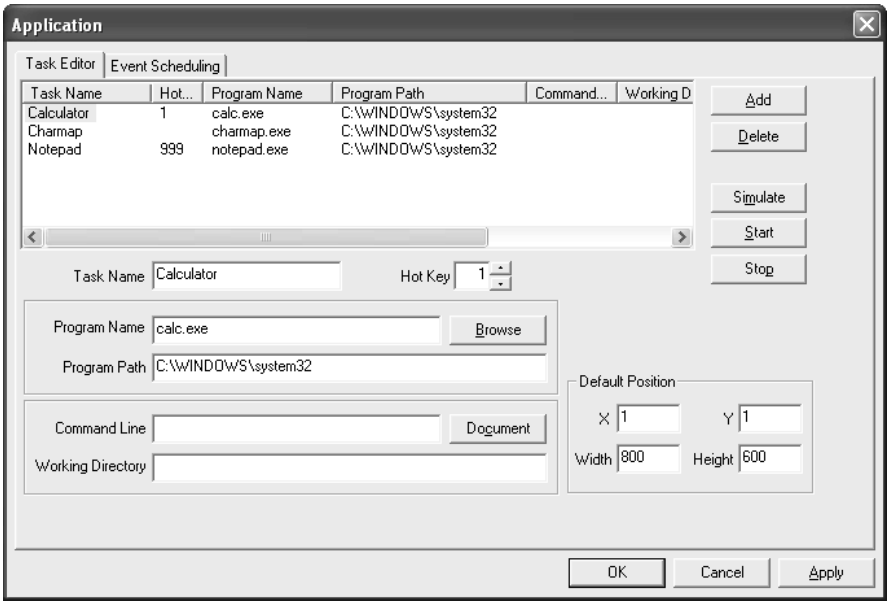


Figure 7. 23. Define a hotkey for any task (T) or event (E)

Using Hot Keys in WallManager

To start/stop a task or event with its hot key, enter the defined key strokes plus <Enter> anytime from within the *WallManager* main. The task or event (application or projector) will appear/disappear as usual. Make sure to also enter the "L" or "K"

prefix needed to define whether you are ***L****aunching* (starting) or ***K****illing* (stopping) the task or event. Example: **KE1<Enter>** will kill (stop) the event having Hot Key 1.

Using Hot Keys Elsewhere

See the *Beyond WallManager: Shortcuts* section of this manual to use your defined hot keys without running *WallManager*.

Shutting Down WallManager

Panic Mode

Select *WallManager*'s Panic Mode (**File, Panic Mode**) when an unusual situation arises that requires stopping the scheduler and allowing only Panic Mode users to start applications on the wall. All other users will have read-only access. This status is indicated with a checkmark in their own *WallManager* **File, Panic Mode** menu, and by a dialog box triggered with any attempts at launching. Applications running when Panic Mode is set continue to run unless a Panic Mode user stops them.

NOTE: Panic Mode can only be toggled on or off by users with this privilege set in their user profile.

⚠ IMPORTANT CAUTION! ⚠

While in Panic Mode, make sure that at least one user retains their right to toggle the function (called "Override/Panic Mode" in *User* window) *off*. Otherwise, *WallManager* will become "read-only" to everyone and must be re-installed.

Disconnecting from WallServer

If you want to disconnect from *WallServer* but leave *WallManager* open, select **File, Close**.

Standard Shutdown

Close *WallManager* at any time. Anything scheduled to run through this client will run as long as *WallServer* is still running. Closing *WallManager* on one client does not affect other *WallManager* clients.

To shut down *WallManager*, click **File, Exit** or the ✖ button on the application window title bar.

7.8 Beyond *WallManager*: Shortcuts

NOTES: Use of shortcuts requires "Hot Keys" assigned in *WallManager*. See *7.5 Using WallManager - Hot Key Shortcuts for Quick Displays.*

Although *Control*MASTER's *WallManager* component offers comprehensive management of a display wall through its application and projector Task Lists, there may be instances when you need even faster and more convenient methods of changing the display. For example, you may want to quickly launch an application with simple keystrokes in *WallManager* instead of having to navigate to *WallManager*'s **Task Editor**, where you must select the desired task and click **Start**. Or you may want the flexibility of quickly previewing something scheduled for a later date. You may even want to by-pass *WallManager* entirely, launching configured tasks via *WallLaunch* or (if present in your system) via serial commands from an RS-232 controller to the FRC-5000 controller.

*Control*MASTER offers three types of shortcuts, all of which utilize "hot keys" that you've assigned for tasks or events in *WallManager*. Depending on your application, you may prefer one type of shortcut over another. Described here are the shortcuts used outside of *WallManager*—refer to *7.5 Using WallManager - Hot Key Shortcuts for Quick Displays* for use of hot keys while running *WallManager*.

Two Ways of Using Hot Keys in WallLaunch

Installation of *WallManager* on a client workstation also installs the *WallLaunch* component. *WallLaunch* is a stand-alone application facilitating direct communication with *WallServer* via IP. This module is installed on user workstations and allows users to launch tasks and events without running *WallManager*. By passing parameters to the *WallLaunch* program, users are able to create multiple desktop shortcuts for launching frequent tasks and events. Direct calls to *WallLaunch* can be incorporated into end-user software to allow for specified tasks and events to be launched when alarm conditions are encountered.

WallLaunch provides two additional ways to utilize hot keys already defined in *WallManager*. One method uses the *WallLaunch* command box, the other uses a *WallLaunch* desktop shortcut. For either method, the hot keys must be assigned in *WallManager* but you do not have to run *WallManager* to use them.

To launch or stop a task/event using the WallLaunch command box:

1) From a workstation, click on the original *WallLaunch* desktop shortcut. A *WallLaunch* dialog box will open on your desktop.

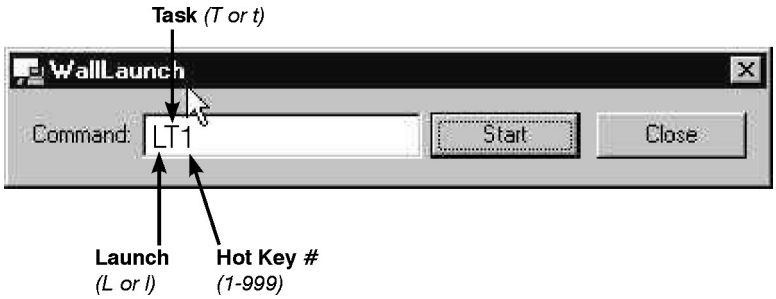


Figure 8. 2 Sample launch task "hot key" command in WallLaunch

2) In the **Command** field, enter the desired hot key as defined in *WallManager*. Preface the hotkey with either "**L**" (launch) or "**K**" (kill/stop). Then include either a "**T**" or "**t**" (task) or an "**E**" or "**e**" (event) as necessary, followed by the assigned hot key number. Click **Start** to display the login box.
3) Enter your password as usual.
4) The task or event will appear (if "**L**") or disappear, (if "**K**") on the display wall, along with the usual wireframe representation in *WallManager*, if it is running.

To launch or stop a task/event using the WallLaunch desktop shortcut:

1) From a workstation, *right* click on your original *WallLaunch* desktop icon. From the pop-up list, select **Shortcut** to create a duplicate icon.
2) Right click the new icon (shortcut) and select **Properties**.
3) In the **Properties** window, select the **Shortcut** tab. The **Shortcut** window will appear (Figure 7.24.)

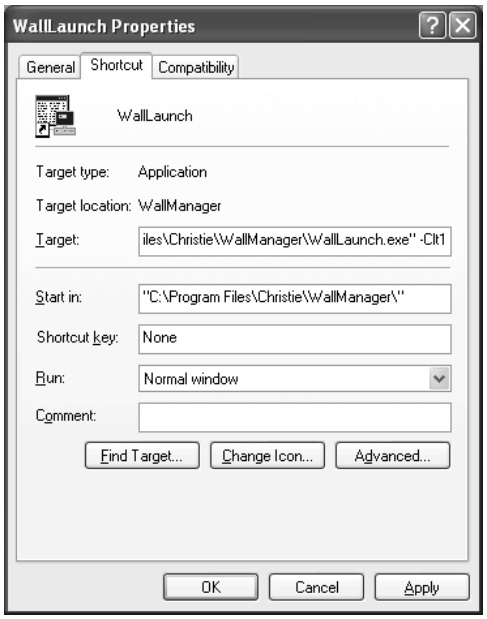


Figure 7.24. WallLaunch Properties: Shortcut window (sample)

4) At the end of the existing **Target** string, add one of the character strings as shown in **bold** in Figure 7.24.

NOTE: Use method "A" for maximum security. Use method "B" if you prefer maximum speed and are not concerned with the fact that your password appears permanently in Shortcut Properties for the new icon (shortcut).

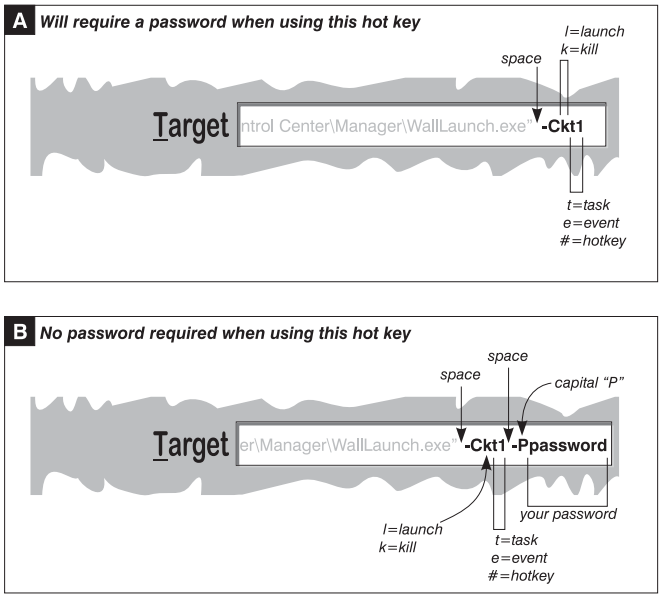


Figure 7.25. Enter which hot key and (if desired) password to use

5) You may want to change the icon appearance to differentiate it from the original *WallLaunch* icon. Click **Change Icon** and select a new graphic.

6) Click **OK** in the **Shortcut** window. You'll now be able to use the new icon to activate or stop the task or event corresponding to your **Target** editing.

7) Repeat as desired for any other hot key.

Using Hot Keys via RS-232 Communications

If an RS-232 control device is connected to your FRC-5000 controller, you can send hot key commands via a single keypress on the RS-232 controller—i.e., without *WallManager*, *WallLaunch*, or passwords. The display will update accordingly.

1) Make sure your RS-232 control device is connected to the FRC-5000 controller and is properly configured as described in your RS-232 control device documentation.
2) In *WallServer*'s **Settings** window, enter the name of the *Panel User* who will be sending serial commands from the RS-232 control device to the FRC-5000 controller. Also make sure the FRC-5000 controller serial port field is correct (it must be the port connected to the RS-232 control device), and that the baud rate is supported by your RS-232 control device.
3) Create the message for the RS-232 control device to send to the FRC-5000 controller. Protocol is as follows:

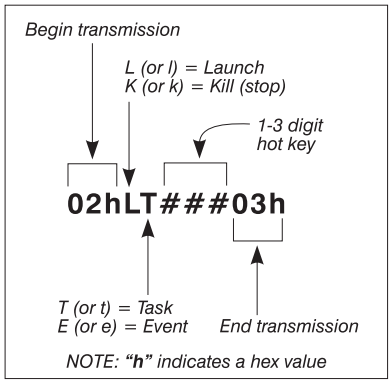


Figure 7. 26. RS-232 Protocol for Hot Keys

Note that leading zeros will be applied for 1-2 digit hot keys—i.e., "1" will be sent as "001" automatically, "50" will be sent as "050" automatically, etc.

Consult your RS-232 controller documentation for further details.

Section 8

Software Installation

Overview

This section describes the complete process for installing all software necessary for the FRC-5000 to run. (For a full system re-install, you must first install XP, then the drivers, then the MASTER*Suite* software)

For software upgrades, you will only have to install new drivers and or the MASTER*Suite* software package, not the Operating system.

8.1 Installing Windows 2000/XP

When installing Windows2000/XP you must have a multi-sync display device attached to output 1 of the FRC-5000.

1) Turn FRC power on.

2) Insert Windows 2000/XP CD into CD-ROM.

3) When option 'press enter to boot from CD' appears, hit **Enter**.

4) Follow the on screen instructions.

Installing FRC-5000 Drivers

To install the FRC-5000 drivers, do the following:

Insert MASTERSuite software CD into CD-ROM.

The auto run should bring up the following dialog box. (If not, select ***Start ⇒ Run⇒*** (type the following): ***D:\mastersuite.exe*** , substitute D: with your CD-ROM drive letter.

Figure 8.3. Installation Dialog Box

1) Click on ***Install MASTERSuite Drivers***. The driver checklist dialog box appears.

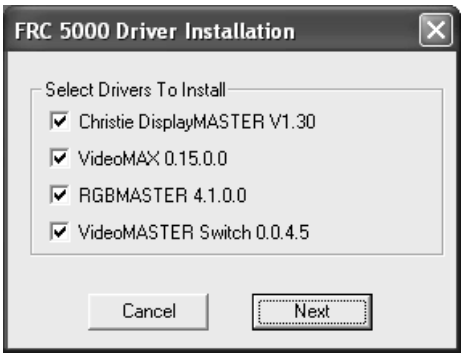


Figure 8.4. Driver Checklist

2) Make sure all drivers are checked and click **Next.** The *Configuration* dialog box appears.

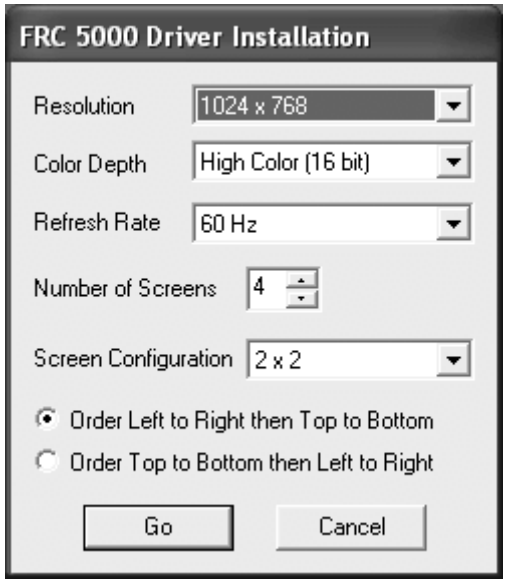


Figure 8.5. Configuration dialog box

3) Select the resolution per display device, color depth, refresh rate, number of screens and screen configuration to match your display wall.
The radio button selection determines how the screen order will be numbered (used for 20-24 head systems using multiple VIM's or multiple VideoMAX to split your wall vertically for displaying video).
Click **Go.**

4) The drivers will now be installed. During the installation the following dialog box will appear for each driver

5) Click the **Continue Anyway** button each time this screen appears

Figure 8.6. Driver signature dialog box

6) Reboot the FRC-5000. The display will now be set to the configuration specified above.

8.2 MASTER*Suite*™ Installation Overview

The following is a list of software components provided for use with the FRC-5000 which comprise the MASTER*Suite* software

- ***Media*MASTER**: This application allows you to display Video and RGB sources on the display wall.
- ***Control*MASTER (*WallServer*)**: This server/client application allows for remote administration of the wall and setting up predefined layouts
- ***Remote*MASTER (*RemoteServer*)**: This server/client application allows operators on the network access the FRC-5000's keyboard and mouse through their local PC.

The following is a list of software components provided for workstations on the same network as the FRC-5000 which are going to run the Control Center or Remote Master applications: The workstations must be running Windows NT 4.0 with service pack 4 or higher / Windows 2000 or Windows XP.

- ***Control*MASTER (WallManager)**: Application to remotely manage the display wall. *WallServer* must be running on the FRC-5000 for this functionality
- ***Remote*MASTER (Remote Client)**: Application to access FRCs keyboard and mouse from your local machine.

8.3 Installing the MASTER*Suite*™ Software

1) Insert *FRC-5000 Software CD* into your CD-ROM. The auto run will bring up the following dialog box.

Figure 8.7. Installation Dialog Box

2) Click ***Install MASTERSuite Application***. The following screen is shown. Wait for the welcome screen to appear

Figure 8.8. Installation setup

3) When the screen below is shown, click **Next**.

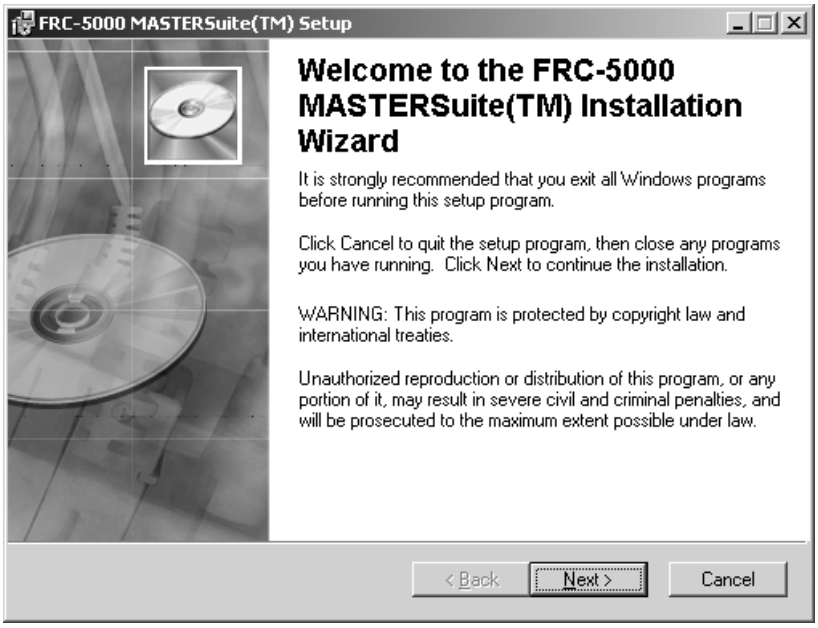


Figure 8.9. Welcome Screen

4) Click **Browse** to specify a destination install folder or Click **Next** to accept the default folder C:\Program Files\Christie.

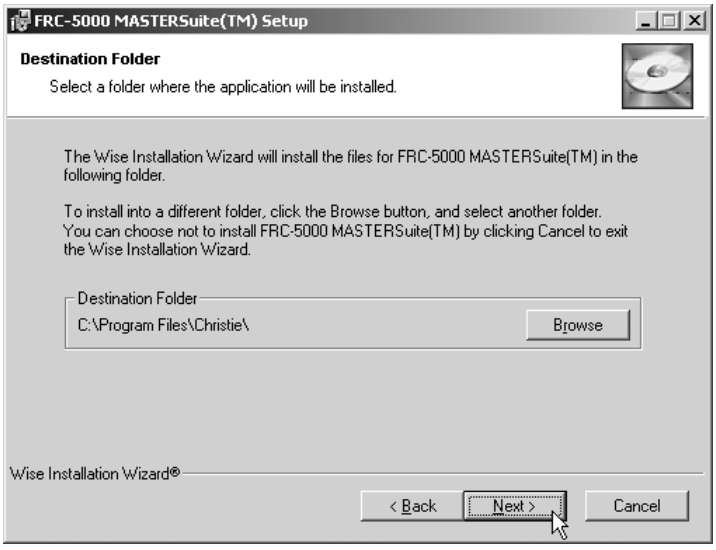


Figure 8.10. Destination Select Dialog box

At this point you are given the option to perform 1 of 3 installations types. Below is a description of each. Please refer to the corresponding section to complete the installation.

- ***FRC-5000 Display Wall Controller Applications:*** This setup is to be run only on the FRC-5000 controller. This will install all of the controller applications (MediaMasater, *WallServer* and RemoteServer). See *Section 8.4.*
- ***NT/2000 Client Workstation Applications:*** This setup is to be run on the client workstations. These workstations will need to be on the same network as the FRC-5000. This will install *WallManager* and RemoteClient. See *Section 8.5.*
- ***Custom:*** This allows you to specify which of the 5 applications will be installed. See *Section 8.6.*

8.4 FRC-5000 Display Wall Controller Applications

1) Select **FRC-5000 Display Wall Controller Applications** and click **Next.**

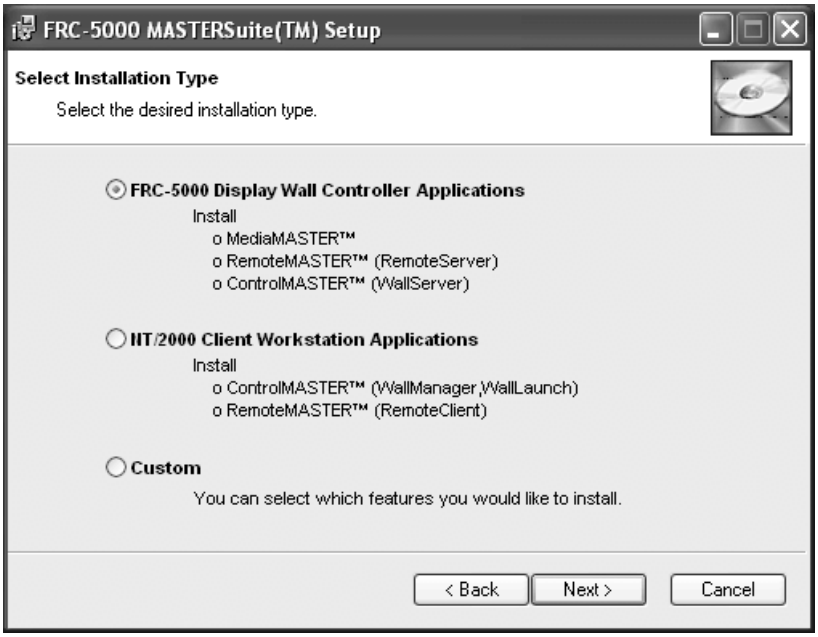


Figure 8.11. **MASTER*Suite installation type dialog box***

2) Click **Next** to start the installation.

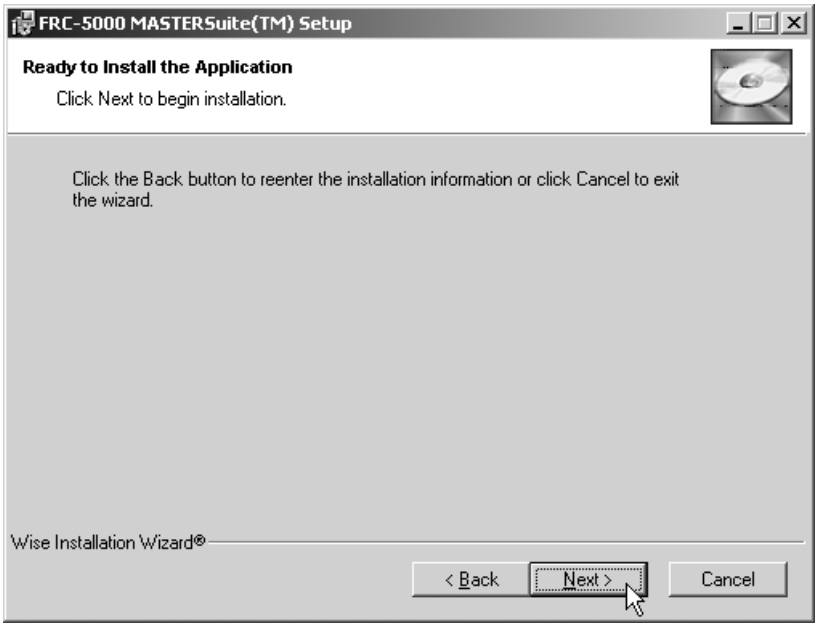


Figure 8.12. Start Installation

3) The program files will be copied to the installation folder

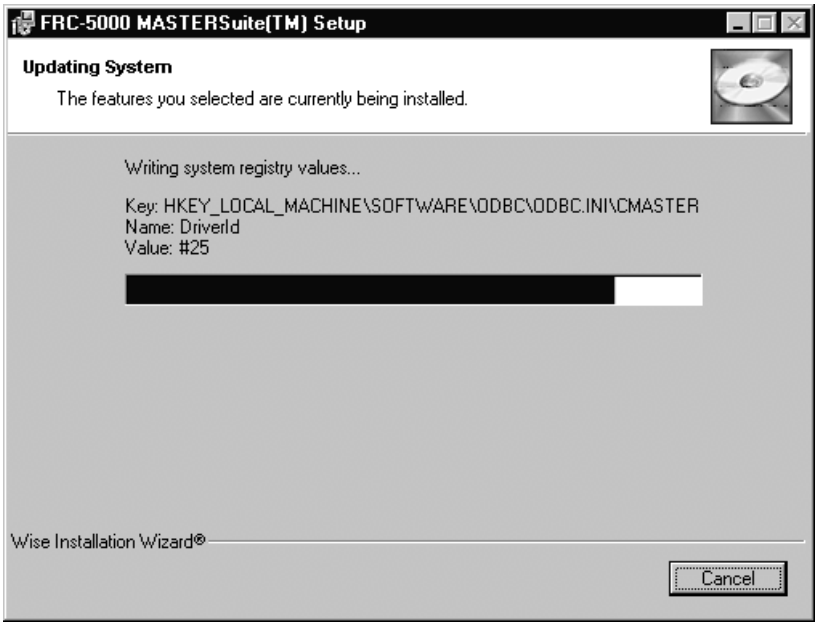
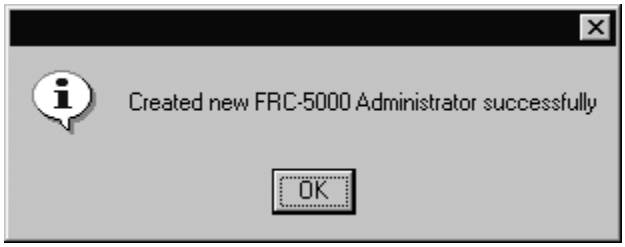


Figure 8. 13. Copying Files to hard drive

4) The following dialog box appears asking to setup an administrator for the FRC-5000 Controller. This user will have to log into the FRC-5000 controller to use the *Control*MASTER or *Remote*MASTER software. Specify a username and password. Click **OK** to continue. (This user can be manually setup, see *Creating the user "FRCAdmin"* from the *Control*MASTER section of this manual.)

5) Click **OK.**



6) The installation is now complete, Click **Finish**. You will now be prompted to reboot your system. (The system must be rebooted before the changes will take place)

8.5 NT/2000 Client Workstation Applications

1) Select NT/2000 Client Workstation Applications and click **Next**.

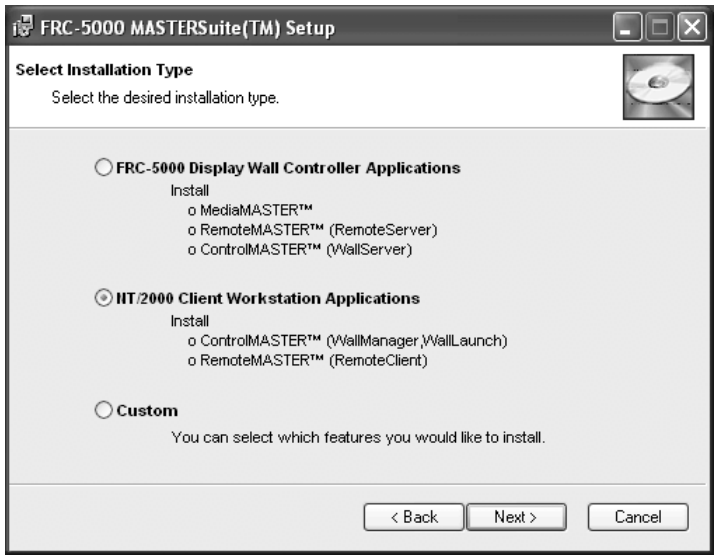
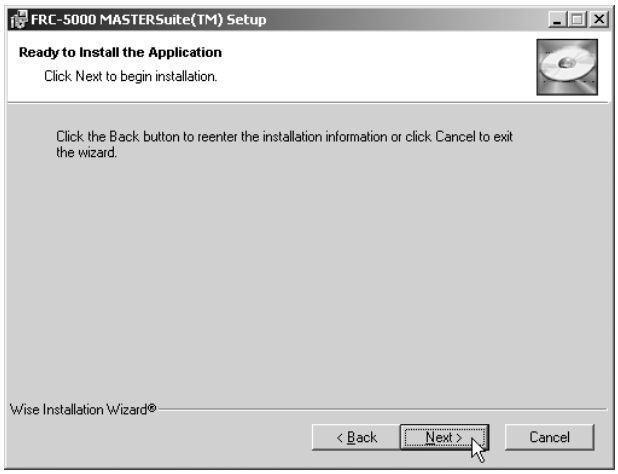
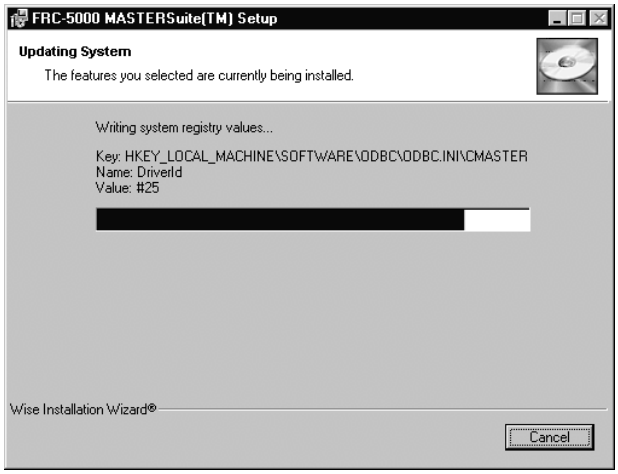


Figure 8.14.* MASTER*Suite installation type dialog box

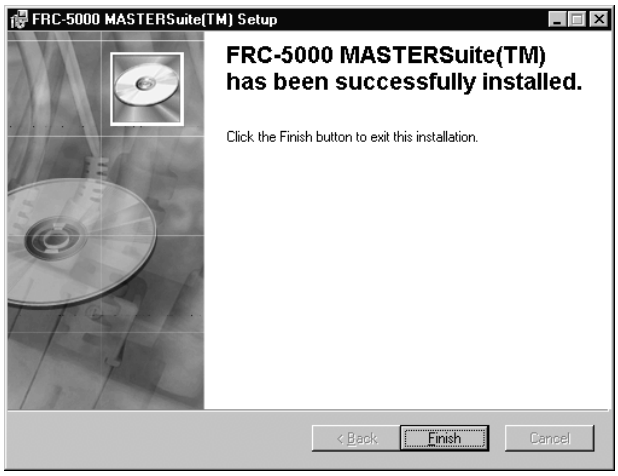
2) Click **Next** to start installation.



3) The program files will be copied to the installation folder



4) The installation is now complete. Click **Finish**.



8.6 Custom Installation

1) Select **Custom** and click **Next.**

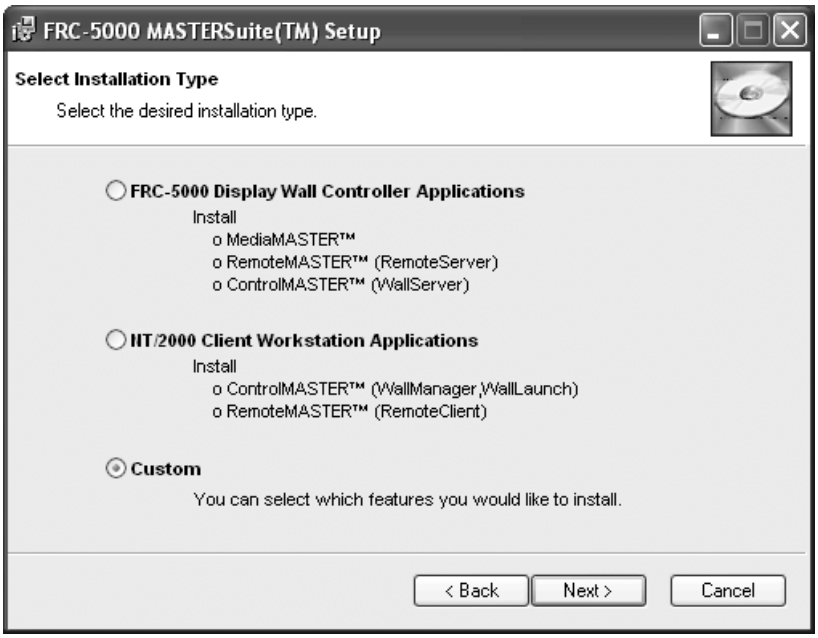


Figure 8.15.* MASTER*Suite installation type dialog box

2) Select the components that you would like to install. Click on the component and select **entire feature will be installed on local hard drive.**

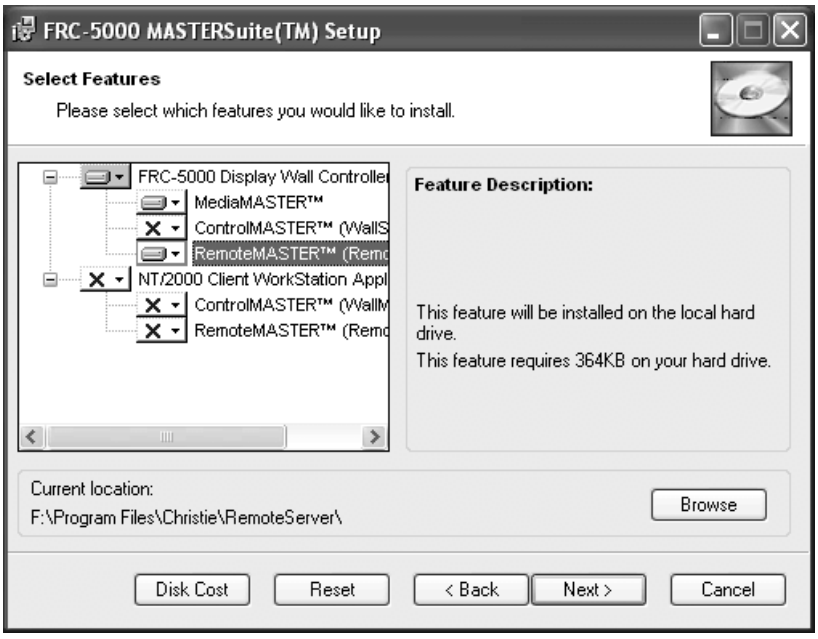
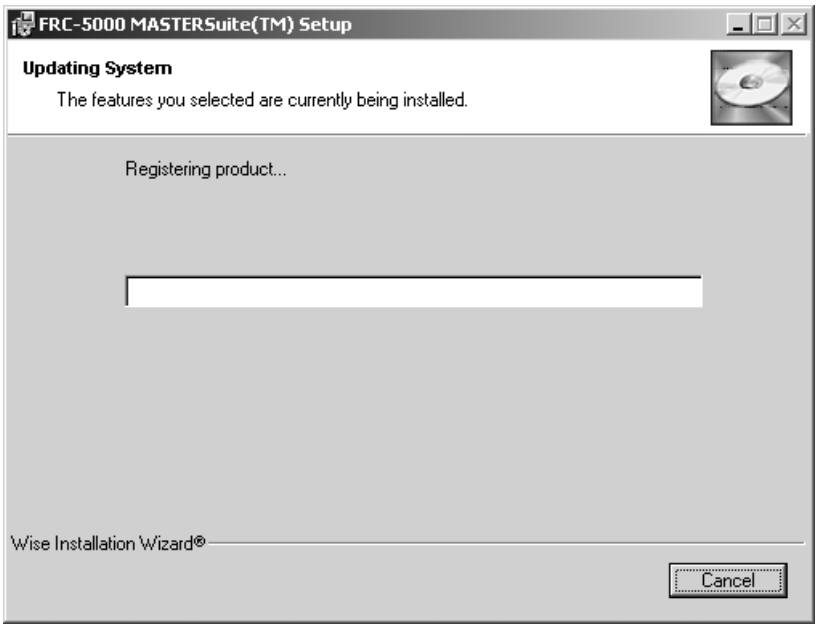


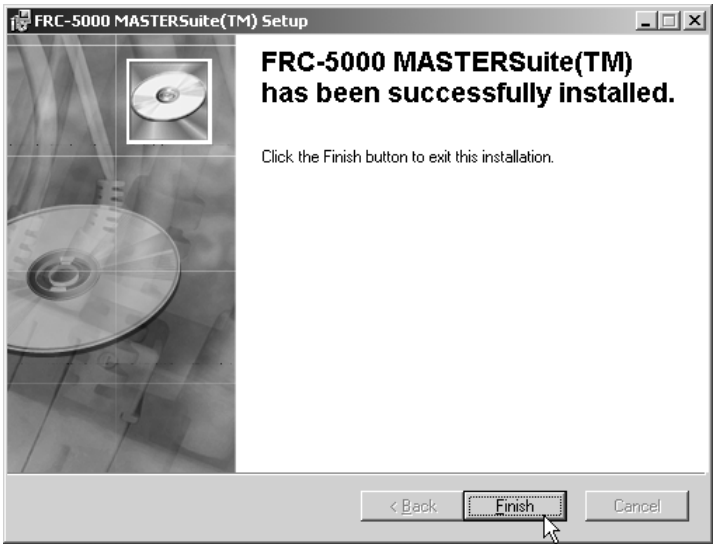
Figure 8.16. Custom Setup Dialog box

3) The program files will be copied to the installation folder



4) When installing *WallServer* component you will be presented with a dialog box to create an FRC administrator. This user must be logged into the FRC for proper functionality of the *Control*MASTER and *Remote*MASTER software.

5) The installation is now complete. Click **Finish.** Depending on which components were installed, you will be prompted to reboot the system.



8.7 Additional Software on the *FRC-5000 Software CD*

View Manual

This will open up the online manual in .pdf form. You need a .pdf viewer (provided) to open this file.

Install Adobe Acrobat Reader

This will install the Adobe Acrobat pdf viewer needed for viewing the manual from the CD.

Install WinaXe 6.2 Trial

This allows you to install an X-Server for viewing X-Compliant applications on the FRC-5000.

Section 9

Service Parts List

9.1 FRC-5000 Service Parts

Refer to the following list for all replaceable parts and modules currently available for upgraded FRC001 and FRC002 models.

FRC-5000 Base Systems

MODULE	PART NUMBER
FRC-5000 4 Graphics Display Controller	38-FRC001-01 or 38-FRC002-01
FRC-5000 8 Graphics Display Controller	38-FRC001-02 or 38-FRC002-02
FRC-5000 12 Graphics Display Controller	38-FRC001-03 or 38-FRC002-03
FRC-5000 16 Graphics Display Controller	38-FRC001-04 or 38-FRC002-04
FRC-5000 20 Graphics Display Controller	38-FRC001-05 or 38-FRC002-05
FRC-5000 24 Graphics Display Controller	38-FRC001-06 or 38-FRC002-06

Replacement/Optional and Upgrade Components
(components applicable to all models unless indicated otherwise)

MODULE	PART NUMBER
CHASSIS	
Hot Swap Cooling Fan	03-000152-01P
Hot Swap Power Module (620W)	03-000613-01P
Hot Swap Power Module (810W)	03-000613-02P
Power Supply Fan Module (620-810W Chassis)	03-000151-01P
Hot Swap Chassis Filter	03-001430-01P
PROCESSING	
20 Slot Backplane	03-000627-02P
SBC-Single Board Computer (for FRC001 models)	03-000628-01P
SBC-Single Board Computer	03-000628-02P
1GHz CPU (for FRC001 models)	03-000619-01P
2.4GHz CPU 400FSB (for FRC002 models)	03-000619-03P
CPU Heatsink & Fan (for FRC001 models)	03-000153-01P
CPU Heatsink & Fan (for FRC002 models)	03-000153-02P
MEMORY	
512MB RAM Module	03-000626-01P
256MB RAM Module	03-000626-03P
STORAGE	
SCSI Raid Controller	03-000625-01P
Hard Drive Carrier	03-000617-01P
Hard Drive Hot Swap Frame	03-000616-01P
18.4 GB Hard Drive, 15K RPM	38-804854-04
36.7 GB Hard Drive, 10K RPM (FRC001 models)	38-804854-02
36.7 GB Hard Drive, 15K RPM	38-804854-05
73.4 GB Hard Drive, 10K RPM (FRC001 models)	38-804854-03

more…

MODULE	PART NUMBER
52 x CD-ROM Drive, Black	03-000614-01P
1,44MB Floppy Drive, Black	03-000615-01P
MULTIMEDIA	
*Display*MASTER– 4 Channel Graphics Module (FRC001)	03-000622-01P
*Display*MASTER– 4 Channel Graphics Module (includes digital overlay for VideoMAX)	03-000622-02P
Digital Overlay Upgrade (converts the *Display*MASTER 4 Channel Graphics Module Analog to Digital for VideoMAX upgrade)	38-804861-01 (1 card per box)
Video Input Module – 4 Channel Analog	03-000623-01P
VideoMASTER Switch Module	38-804850-01
VideoMAX Module (can only be installed in units that have Windows®XP or Windows®2000, kits are available if required–also requires *Display*MASTER with digital overlay)	38-804856-01
RGBMASTER, Dual RGB Input Module	38-804851-01
Sound Module	03-000624-01P
NETWORKING	
4 port 10/100 NIC	38-804852-01
I/O	
Enhanced Keyboard, Black	03-000618-01P
3 Button Mouse, Black	03-000621-01P
SOFTWARE	
Windows® 2000 with MASTERSuite	38-804859-01
Windows® XP with MASTERSuite	38-804860-01
MANUALS	
FRC-5000 User's Manual	54-017167-xxP (order 54-017167-03P for FRC001)
FRC-5000 Service Instruction Booklet	54-017169-xxP

Section 10

About CHRISTIE

Company and Products

Christie Digital Systems is a world leader in high-performance projection solutions for cinema, control rooms, rental staging, 3-D/immersive, meeting rooms, conference rooms and fixed installation environments.

Christie has more than 70 year expertise in cinema projection technology and more than 25,000 large screen projection solutions installed worldwide. As the first DLP Cinema™ licensee, Christie is playing a leading role in developing digital cinema projection.

Christie is an Academy Award recipient for its gearless projectors and has won numerous industry accolades namely for DigiPro™ - the world's first purpose-built rental staging projector.

Specializing in a full range of film projection solutions, Christie sells gearless projectors, electromechanical film handling systems, consoles, autowind film handling systems, endless loop film systems, automation devices and Xenolite® bulbs.

Christie is also the only manufacturer to offer a comprehensive line of video/data/graphics projection solutions based on three current technology platforms: Digital Light Processing™ (DLP™), Poly-Silicon LCD and Cathode Ray Tube (CRT). To complete this entire line of projection solutions, Christie sells videowalls, rear screen enclosures, input modules and interfaces.

Christie employs more than 200 professionals worldwide. Design, manufacturing and assembly facilities are located in Canada and the United States. Branches are located in Germany, Hong Kong, Luxembourg, Singapore and the United Kingdom (UK) along with consulting offices in Italy and Spain.

Christie is a jointly-owned subsidiary of Ushio America, Inc. and Ushio, Inc.

CHRISTIE Technical Support

You can reach the FRC-5000 Controllers Development and Support Group at Christie by sending e-mail to mailto:support@christiedigital.com. In North America, phone 1-800-221-8025.

Updated contact information can be found at http://www.christiedigital.com/ under "contact us".

Complete contact information is provided on the following page.

NORTH AMERICA

CHRISTIE Digital Systems, Inc.
809 Wellington St. North
Kitchener, Ontario, Canada N2G 4Y7
Tel. 519-744-8005 *(General)*
Toll Free 1-800-221-8025 *(Technical Support)*
Email: support@christiedigital.com

EUROPE

CHRISTIE Digital Systems, Inc.
View Point
200 Ashville Way
Workingham, Berkshire RG41 2PL
United Kingdom
Tel. +44(0)-118-977-8111
Fax +44(0)-118-977-8112
Email: tech-europe@christiedigital.com

CHRISTIE Digital Systems, Inc.
Hohenzollernstraße 124-126
41061 Mönchengladbach
Germany
Tel. +49-2161-664540
Fax +49-2161-664546
Email: tech-europe@christiedigital.com

CHRISTIE Digital Systems, Inc.
10 Ave. George Pompidou
92593 Levallois-Perret Cedex
France
Tel. +33-(0)1-47-48-28-07

ASIA-PACIFIC / OTHER

CHRISTIE Digital Systems, Inc.
627A Aljunied Road
05-02 Biz Tech Centre
Singapore 389842
Tel. 65-877-8737
Fax 65-877-8747

CHRISTIE Digital Systems, Inc.
Rm. C1109, Orient International Bldg. (Part C)
85 Lou Shan Guan Rd.
Shanghai, 200336
People's Republic of China
Tel. +86-21-6278-7708
Fax +86-21-6278-7707

Index